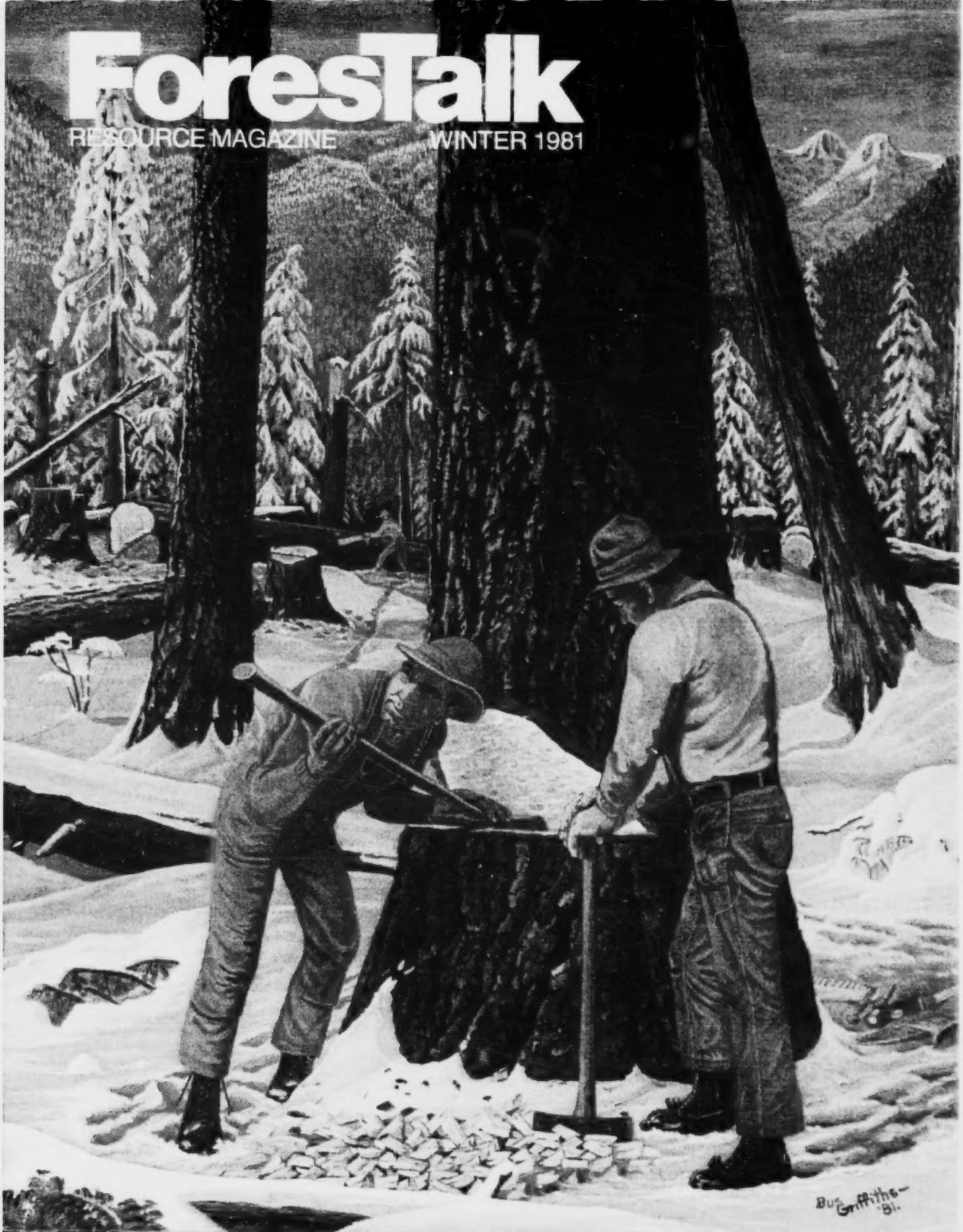
ForesTalk

RESOURCE MAGAZINE WINTER 1981



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ForesTalk

Volume 5 Number 4 Winter 1981

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Cover: Handlogging is a thing of the past, but one handfaller who still vividly remembers what it was like back then is Bus Griffiths of Fanny Bay on Vancouver Island. Today, Bus is an artist whose paintings have been widely acclaimed for their attention to detail in depicting life in the west coast woods nearly half a century ago.

This issue's cover painting by Bus is a self-portrait; his vision of what he was like in 1947, the last winter he worked in the woods. Here he is seen "gunning it," sighting along his axe handle to make sure the Douglas fir falls exactly where he wants it to go.

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The story on page three details winter logging in the Prince George area, a region hard-hit by the spruce beetle. This beetle along with the mountain pine beetle, already have chewed their way through one-half million hectares of B.C. forests; a further 2.5 million hectares is in jeopardy. The forests ministry therefore will spend $11.4 million to build roads into beetle-kill areas to promote the orderly, planned harvest of threatened wood. This sanitation logging eventually will control the insect invasion and will lay the basis for reforestation programs that will minimize the recurrence of such attacks.

Tom Waterland

Hon. Tom Waterland, *Minister of Forests*

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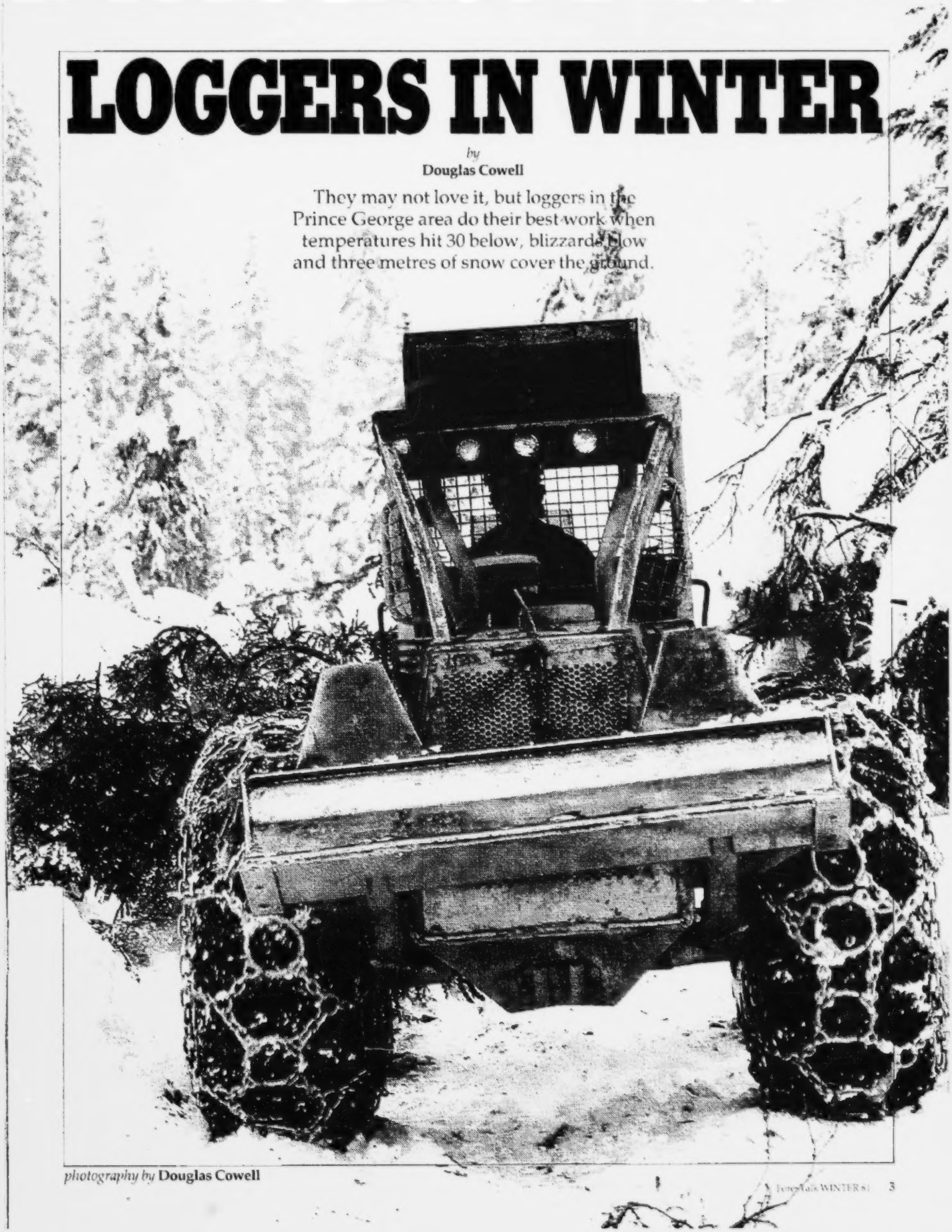
LOGGERS IN WINTER

by
Douglas Cowell

They may not love it, but loggers in the Prince George area do their best work when temperatures hit 30 below, blizzards blow and three metres of snow cover the ground.



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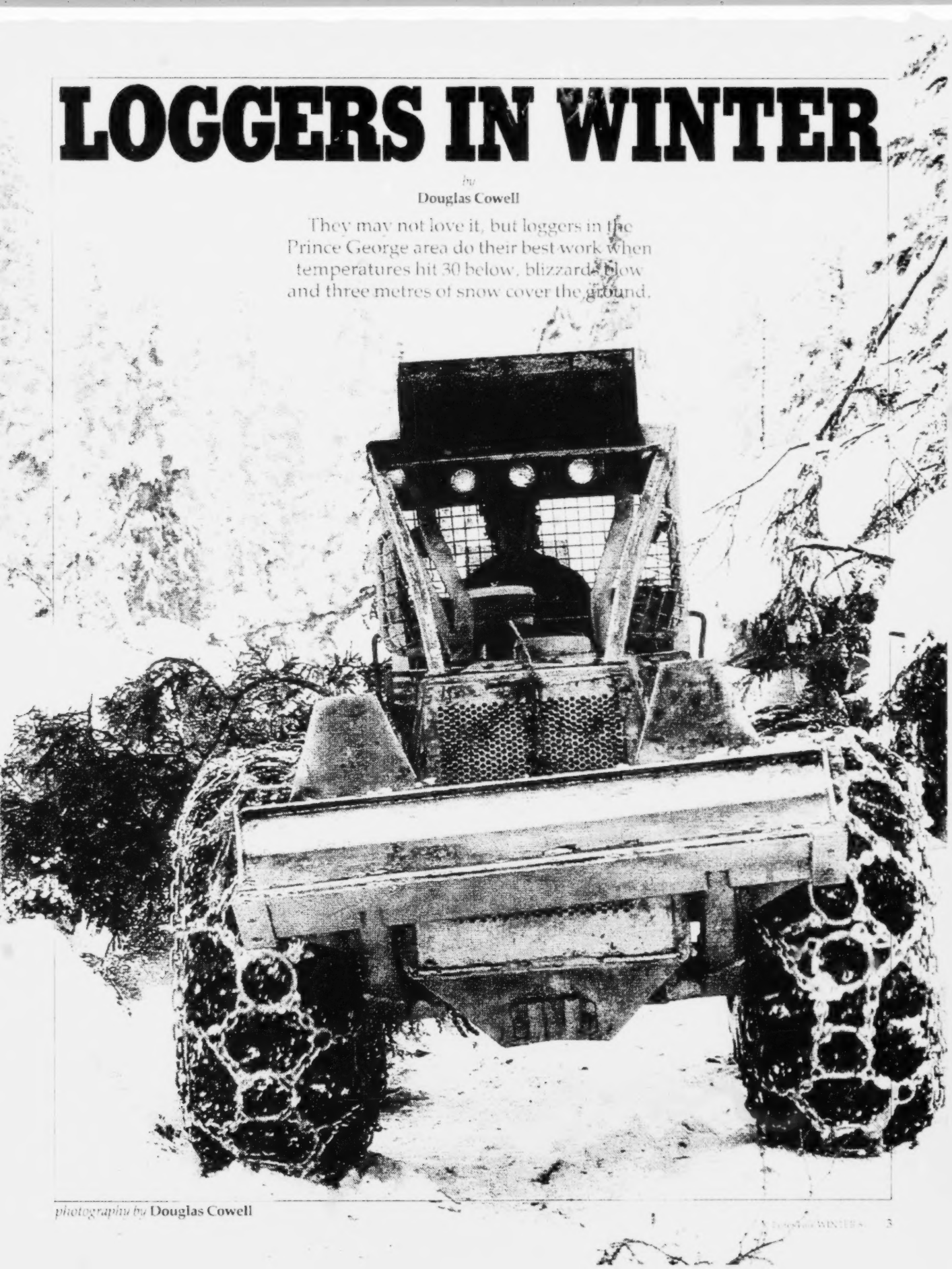


photographs by **Douglas Cowell**

At midnight, when his alarm goes off, it is still snowing. Emil Green, a contract gravel truck driver at Einar Camp, a logging operation on the upper McGregor River southeast of Prince George, fumbles for the light switch. He sits for a moment collecting his thoughts; it's only been three hours since he hit the sack. He fights the temptation to dissolve back into his dreams. There're too many people counting on him.

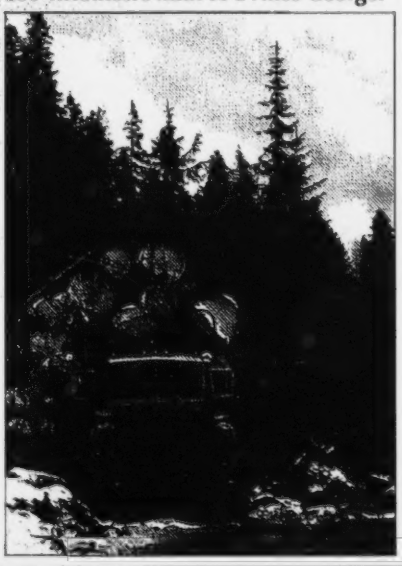
The previous night, when the logging truck drivers were fueling up and putting chains on their trucks, Emil had been busy attaching a plow blade to his vehicle. Einer Camp is 80 kilometres from any paved road and all 80 kilometres are slippery and soft. The day previous, drivers could barely keep their rigs on the road. If it isn't plowed this morning there will be accidents for sure.

More alarms ring at three a.m. and groggy truckers stumble toward the cookshack and coffee, holy coffee. Quietly the ham and eggs, flapjacks, homefries, toast and jam disappear, almost unnoticed.

The push is on. Truckers work from three a.m. to after dark to get two loads of logs into Prince George, 160 kilometres west. The woods crew keeps the timber coming as fast as the truckers can move it out.

This time of year it's always busy. Breakup begins sometime in March; the forest companies have to ensure that they have enough wood in their yards to keep the mills operating until summer operations are underway.

***Walter Yungen** (left) of McBride is a faller — the most dangerous job in the forest industry. The trees he falls are sorted on the spot into sawlogs, pulp logs and peelers for plywood and then loaded onto trucks (below) for the 160-kilometre haul to Prince George.*



But this year there's even more pressure to get the trees out. A massive infestation of spruce beetles has hit the Prince George East Forest District, and now almost every operator is cutting only "beetle wood," trying to remove as many infested trees (and thus as many beetles) as they can before the breeding cycle repeats itself in early summer. Throughout the district, logging plans have been changed, camps have been moved, new roads have been pushed through to get at the damaged wood.

Although logging in winter is the norm in the Prince George area, where 70 percent of the cut is done in winter, it's still always a demanding job. Temperatures regularly hit minus 30 or 40 degrees celsius. Blizzards are common; two to three metres of snow cover merely usual. But it's these very conditions that make winter the best time for logging.

Roy Parlette, Northwood Pulp and Timber woods supervisor at Einar Camp, explains: "About 70 percent of the land around here is too soft, too wet to operate machines on in summer. They'd sink out of sight. Much of the land is spruce bog. In winter everything freezes up solid and there's no problem."

Road builders love winter too. As the temperature plummets, hopelessly soggy swamps turn into perfect roadbeds; with a quick bulldozing and a little plowing you've got a haul road. And then there are the ice bridges, which are carefully checked and maintained roads on the ice over a river or lake where building a permanent bridge would be out of the question.

But winter does have its disadvantages. It's cold. "The best temperature for working is between 20 and 35 degrees below," Parlette explains. "The roads hold up best when they're really cold and machinery works well. But colder than that is getting pretty nippy. Most men won't work past 40 below. Metal gets brittle. Machines break down and it's too cold to repair them.

"Even at normal temperatures I don't know how those guys do it. They'll lie under a skidder for three hours working away on something with their bare hands. If a big repair comes up they'll toss a parachute over the machine, put a space heater under it and go to work."

Storms can be a problem too. "In 1978 it was blowing so hard and snowing so heavily one day that we couldn't keep the roads open. We got everyone back to camp but it was getting worse. We had to get out. We made up a caravan of about 40 trucks with a big D-8 tractor in front, and then two graders. It took us six hours to reach the pavement and, as we went, the road was blowing in right behind us."

In the winter of 1980-81 they had even bigger problems. It wouldn't get cold enough. "We'd have maybe a day or two of minus 20, then it would snow a couple days, then turn into rain," Parlette recalls with disgust. Throughout the district the roads never really froze up solidly. Truckers complained. Road maintenance people worked overtime. In the bush, landings turned into mudholes. Operations shut down repeatedly and production figures went down.

Einar Camp lies in a river valley bottom. Parlette describes what happened during a thaw in late December: "The river was rising fast with all the rain. Then, in the afternoon, the ice began breaking up. It jammed up just at the corner and water began coming overland. In no time it was coming through camp, iceflows and all. We got most of the vehicles out, but it was crazy. Wooden walkways were floating around camp, ice was everywhere and the water was getting deeper. When it reached the doors of my truck I got out and pulled the batteries out of the camp power generator."

All night he huddled in his truck, watching as the water level slowly went down. In the morning he sloshed back into camp, got the power back on and soon had heat in all the buildings. Nothing froze and the camp was back in operation in two weeks.

The constant warm weather that so plagued the loggers did just the opposite for their competition — *Dendroctonus rufipennis* — the spruce beetle. It usually lives unnoticed in the forest, feeding on dead trees or moving in on the old, weak ones.

The beetle begins life as an egg under the bark of a spruce tree. For two years it feeds on the cambium layer and then, in early summer, emerges and flies off to find a new host tree. The cycle repeats.

Cold winters traditionally kill off much of the beetle population, but a recent string of warm winters has resulted in more beetles making it through to spring. Then a series of hot dry summers has reduced the trees' ability to resist the infestation. This has enabled the beetles to compress their life cycle into one year and has practically doubled the beetle problem overnight.

The other natural beetle control is the limit on the amount of food available. But summer windstorms through the mid-1970s flattened hundreds of hectares of forestland, providing endless feeding grounds for the beetles.

At Einar camp the last people to get up are the woods crew. They can't work until it's light out, so at a lazy 5:30 a.m. they drift into the cookshack and wrap themselves around a good logger's breakfast before heading for the bush.

Walter and Verner Yunger, two brothers from McBride, are logging partners. They jointly own a skidder which Verner operates. Walter, the elder, is the faller. Up at the worksite Verner gloomily starts up the skidder and then, digging it out of a drift, rolls underneath with a grease gun. He knows that all the trees left on the ground overnight will today be packed in tight with snow. He's going to have to waste time fighting to get them unstuck before dragging them to the landing. Some of them are bound to break.

Walter is no bundle of laughs either. He knows what's waiting for him after the previous night's storm. The falling snow muffles the whine of his chainsaw as he cuts a notch out of his first tree. "Of course it's leaning the wrong way," he grumbles as he begins the backcut. As soon as the cut is deep enough he plugs it with a faller's wedge. When he gets that indescribable feeling that the tree is just about to sit back and pinch his saw bar he stops cutting, pulls out his axe and gives the wedge a good bang. Quickly he hunches forward, protecting his head. The world turns white as great lumps of sodden snow smash down on his hardhat and shoulders.

"Bugs or snow. Summer logging or winter logging. What's the difference?" he philosophizes. He shrugs it off, finishes driving the wedge, and brings down the tree.

As he moves on to the next one he reminds himself he's going to have to be extra careful today. This is his sixth straight day of work. He's tired and he doesn't like it. That's when accidents happen.

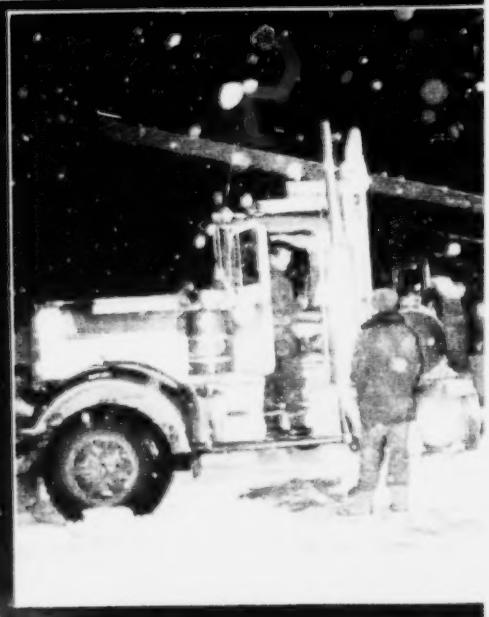
A good faller is more than skilled. He can glance at a tree and, without labouring over which way it's leaning, which side has the most branches, which way the wind is blowing, know almost instinctively what the tree will do. He senses it in his body.

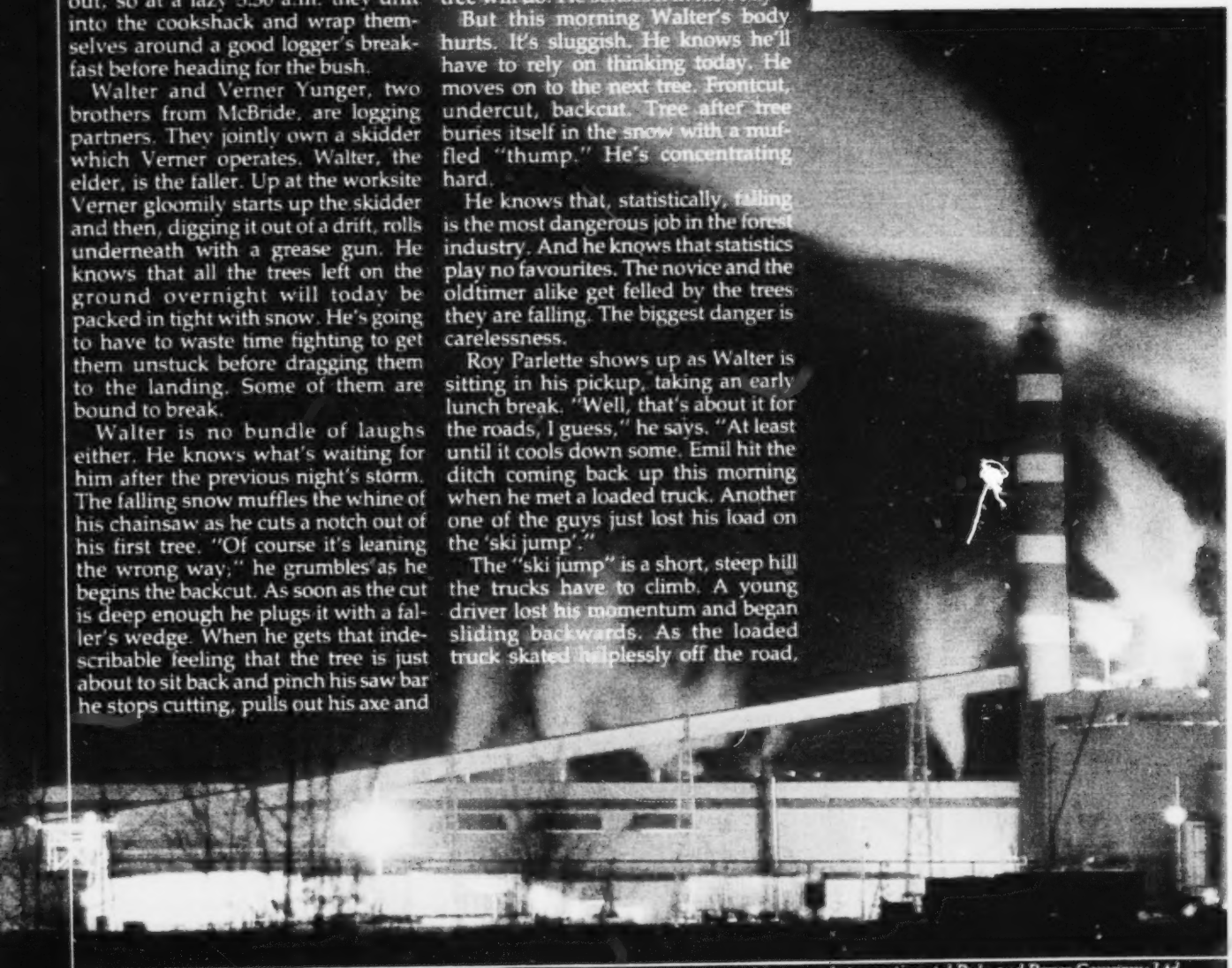
But this morning Walter's body hurts. It's sluggish. He knows he'll have to rely on thinking today. He moves on to the next tree. Frontcut, undercut, backcut. Tree after tree buries itself in the snow with a muffled "thump." He's concentrating hard.

He knows that, statistically, falling is the most dangerous job in the forest industry. And he knows that statistics play no favourites. The novice and the oldtimer alike get felled by the trees they are falling. The biggest danger is carelessness.

Roy Parlette shows up as Walter is sitting in his pickup, taking an early lunch break. "Well, that's about it for the roads, I guess," he says. "At least until it cools down some. Emil hit the ditch coming back up this morning when he met a loaded truck. Another one of the guys just lost his load on the 'ski jump'."

The "ski jump" is a short, steep hill the trucks have to climb. A young driver lost his momentum and began sliding backwards. As the loaded truck skated helplessly off the road,





Intercontinental Pulp and Paper Company Ltd.

Winter logging in the north is serious business. In the Prince George region, for example, over 70 percent of all logging is carried out during the winter months. The three pulp mills in Prince George regularly operate through the night, and their lights can be seen for miles around. Darkness and snow are normal working conditions for the truck drivers hauling wood to the mills.

the trailer flipped over and pulled the tractor unit with it. The logs broke their binders, exploding down the bank. Damage to the truck was light: a crumpled fender, a mirror wiped away. The driver emerged unhurt. Had he slid another 15 metres he would have been climbing out of the cab under three metres of icewater.

As Walter trudges back out to the bush he calls Verner over to tell him the news. They're shutting down the camp. If it doesn't freeze up again, this could be the end of the season. He goes back to work. Frontcut, undercut, backcut, "thump!" Verner bounces past on the skidder with a load of logs. He's happy. Walter can tell that by the way Verner is riding the machine; sitting tall, rolling with it. He'll be on his way to Prince George in a few hours. There will be partying tonight.

Many of the trees Walter is falling still have green crowns but, characteristic of beetle-infested spruce, their bark has been torn off by woodpeckers feeding on the beetle larvae. These trees are doomed, as are several million others throughout the 1.8-million-hectare Prince George East Forest District. Russ Cozens, Ministry of Forests pest management officer in Prince George, estimates the total value of wood under attack to be $875 million. He judges the value of the timber "at risk" to be over one billion dollars.

"Beetles usually choose to settle in freshly windfallen trees or in living ones that are stressed or weakened," says Russ Trenaman, the forests ministry's district manager for the area. "That means their favourite homes are mature or over-mature stands, of which we have huge volumes. These, the largest and most valuable trees, are also the least resistant to the beetle. Since the economy of the area is dependent on these forests, we can't let this infestation go unattacked.

"When we discovered, in the fall of 1979, that we had a spruce beetle epidemic on our hands, we had to move fast. After a quick survey, we scrapped our new five-year management plan to concentrate on cutting infested wood."

Northwood Pulp and Timber is the largest forest products company in

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the area, and all of its operations, including Einar Camp, are cutting beetle-infested wood. Martin Litchfield, Northwood's planning supervisor, leads a team that is making intensive use of computers to help in long-term forest management planning. "This beetle epidemic is having the single largest effect on our operations of anything we've run into yet. We'll be all right; we have a large enough area that we can shift things around, but it's meant a lot of extra work."

Not everyone is so lucky. Tony Novak, president of Dunkley Lumber, a small mill and woods operation near Hixon, has all his timber in one of the hardest hit areas. "It's a shame to see so much good wood going to waste. Our sawmill could handle 100 percent more beetle wood, and we still wouldn't lick the problem in this area."

David Stevenson, habitat technician with the environment ministry's Fish and Wildlife Branch, has a different perspective: "The whole situation is extremely unfortunate. To manage fish and wildlife you need habitat. Our research has shown that cut blocks larger than 80 hectares have a negative impact on moose habitat, and moose is our primary big game species here. But cut blocks can run as large as 2,000 hectares in beetle-attacked areas. They don't have to be that large, and we are working with the forests ministry to minimize the effects of large cut blocks on fish and wildlife."

It's common practice for a faller and a skidder operator to contract out their services as a team. Faller Robert Kinney** (above) **works with a partner from Valemont; Verner Jungen** (below) **skids out all the trees cut by brother Walter** (page 4). **These men shrug off the unpredictablity and hardships of logging in winter; uncertainty and hard work are just part of the job.

Walter Jungen isn't pondering the rights and wrongs of cutting plans right now. He's just trying to get through this last half hour before his work day ends. Then he can get some much needed sleep. Frontcut, undercut, backcut . . . "LOOKOUT!" Backpedalling frantically he lunges sideways, throwing down his saw as a falling tree whishes by inches above his head and buries itself in the snow.

The forest is quiet again. Walter rolls over, coated in snow. The tree he was cutting had brought down a second one as it fell. It was that second one, which had snapped off under the snow, that almost levelled him.

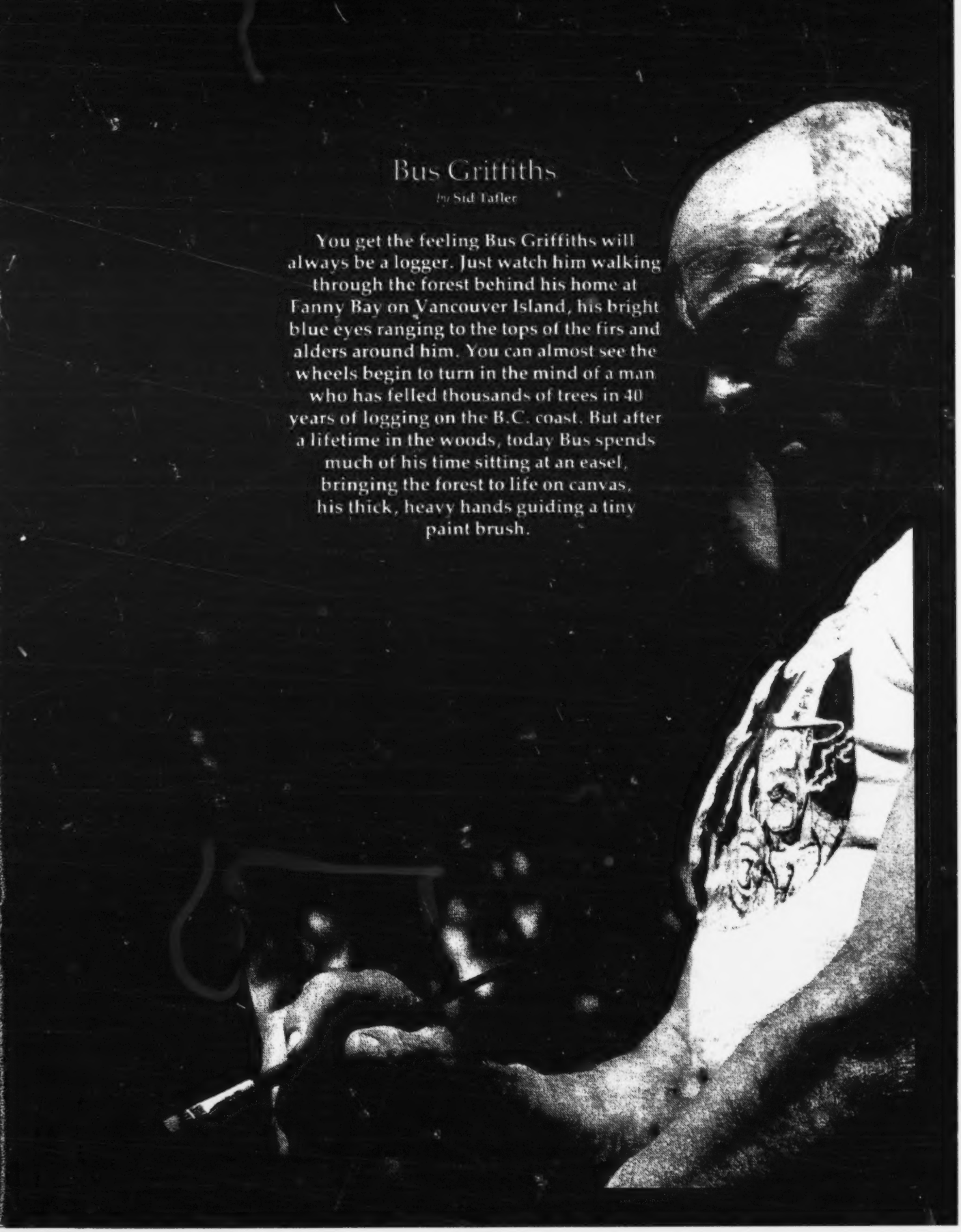
He lies there for a moment, thinking it over. Sheepishly he picks himself up, brushes away the snow and rescues his saw. "That's the first close call I've had in over a year. I guess I had it coming."

Verner and Walter laugh about it later. What else is there to do? Whether it's a winter that won't get cold, or beetles that kill the forest, or a tree with a mind of its own, you take them as they come. It's all part of the job.

Bus Griffiths

by Sid Tafler

You get the feeling Bus Griffiths will always be a logger. Just watch him walking through the forest behind his home at Fanny Bay on Vancouver Island, his bright blue eyes ranging to the tops of the firs and alders around him. You can almost see the wheels begin to turn in the mind of a man who has felled thousands of trees in 40 years of logging on the B.C. coast. But after a lifetime in the woods, today Bus spends much of his time sitting at an easel, bringing the forest to life on canvas, his thick, heavy hands guiding a tiny paint brush.



Bus is the author and artist of *Now You're Logging*, the cartoon novel about logging in the 1930s, and his paintings have been widely acclaimed for their painstaking attention to detail and flawless accuracy in depicting life in the west coast woods and logging camps half a century ago.

Bus's back room is framed on two sides by sliding glass doors, so he's just a glance away from the thimbleberry bushes that border the towering coastal forest behind him. You can tell his heart is still in those woods, with the hard-edged, highballing men who felled and bucked giant firs and cedars two generations ago with their wits and brawn, axes and hand saws.

"It was a tough life," Bus recalls in soft-spoken, even tones. "And it bred rugged, independent men who took pride in their work. Even if a man was just a whistle-blower, he wanted to be known as the best whistle-blower on the coast. You could make better money at other jobs, but you could never convince a logger of that."

His real name is Gilbert Joseph, but it's hard to find anyone who doesn't call him Bus, short for Buster, his lifelong nickname. At 68, his scruffy hair is mostly white, his brow is heavily furrowed, and his clear, deep-set eyes are framed with crow's feet. But his step is still sure and his hand steady, and when he lifts an axe and approaches a tree, you can almost see the timber shiver.

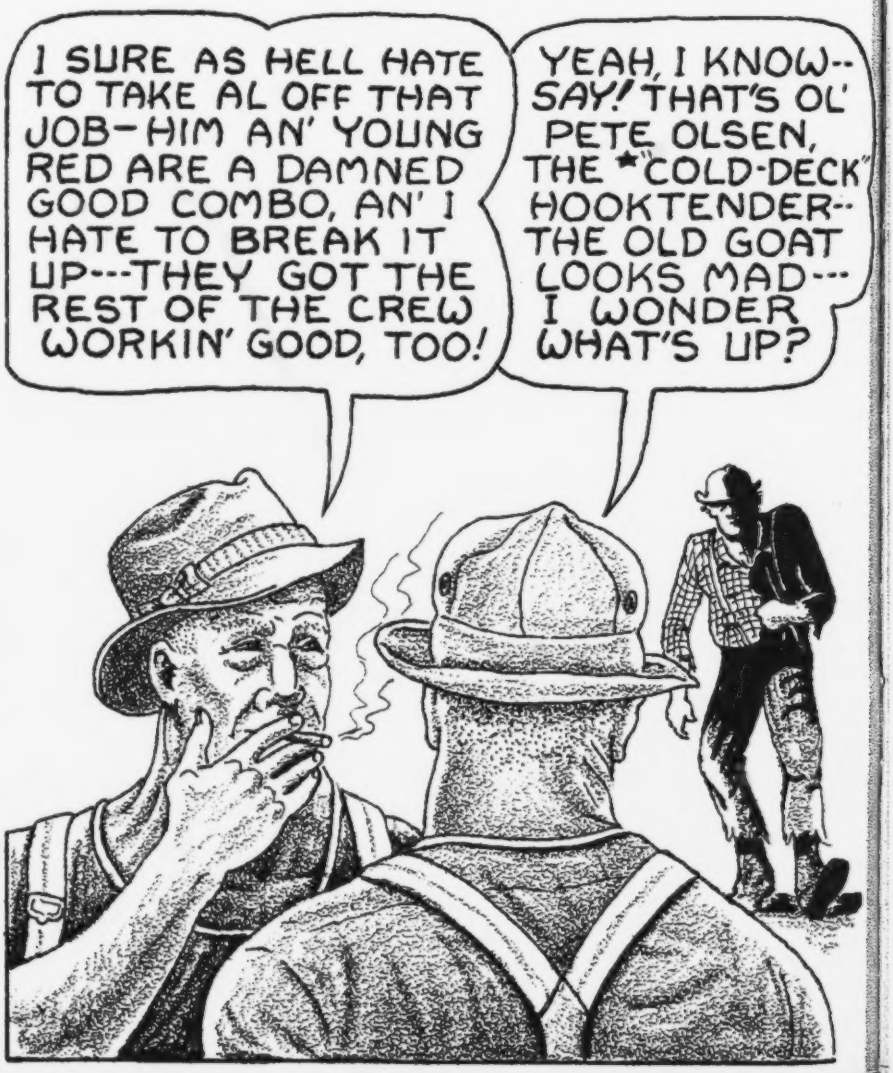
Bus was born in Moose Jaw and raised in Burnaby, where his family lived in a cabin surrounded by second-growth timber. He was bitten by the logging bug as a young boy, when a man came to fall a good-sized fir in the woods behind his home. Bus watched with fascination as he chopped out the undercut and then worked on his own with a falling saw. To Bus's surprise and admiration, the tree dropped down right where the man wanted it. The young boy persuaded his father to let him fall and buck trees in the neighbourhood woods on his own, which soon led to a job cutting cordwood for a Burnaby man "for the big sum of $2 a week and two meals a day." After he left school, Bus endured a short and unhappy stint as an office boy and was grateful when his boss laid him off when the Depression struck. Bus decided quite emphatically that his future lay in the woods, and he joined a logging crew on the mainland.

He first learned how to splice line and worked at a variety of tasks, learning the trade from the ground up. But the job he found most satisfying and challenging was falling, working with another man chopping an undercut and then cutting through the timber with a "Swedish fiddle" — a two-man saw up to 12 feet long. "It never gets monotonous because no two trees are the same," Bus says of handfalling. "You get a different tree and different problems all the time. But if you were good you could get quite accurate — you'd get a couple of stumps out there close together and you'd put a big tree right between them." So Bus became a faller working with various logging crews in the Fraser Valley, Howe Sound, and later, on Vancouver Island at Fanny Bay and Buckley Bay.

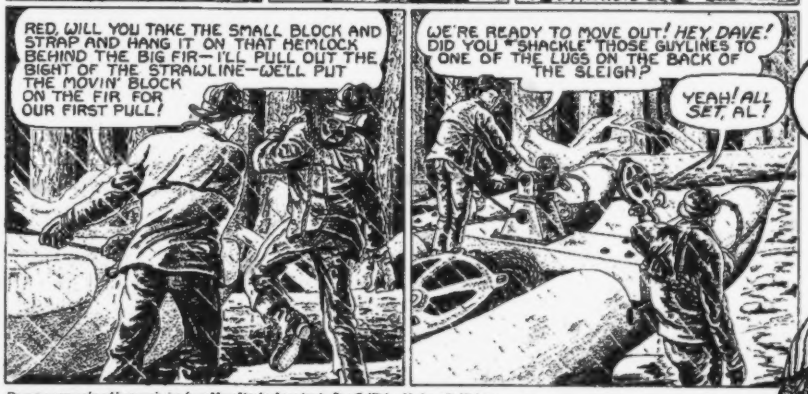
Bus loved the work because of the physical and technical challenge, the outdoor environment and the close contact with nature. And he had a natural affinity for the hard, strong-willed men of the woods who shared his work and life. Loggers were a breed apart from city or farm people, and they lived by their own codes which stressed teamwork, skill and pride of accomplishment. The woods also produced their share of characters and showmen who took great satisfaction in their work and weren't shy about flaunting their skills and bravery.

Bus remembers one man who would top a spar tree and then sit on the stump, roll a smoke and puff away while he shouted at the men working on the rigging 180 feet below him. When he finished the smoke, he'd slip down, tie his safety rope around him, drop his hat over the side and then jump down the tree in great spiralling leaps of 10 or 12 feet. "I can't ever remember him not beating his hat down. And when he'd get to the bottom, he'd stand there with a big cocky grin on his face, his blond hair shining in the sun."

In those days, teamwork was all-important to logging, and if the men on a crew worked well together, they performed like an efficient, well-tuned machine. A good pair of fallers worked so smoothly they couldn't even feel each other at the other end of the saw as they cut through timber. "You just pulled it back and didn't push it the other way," Bus recalls. "It was kind of a rocking motion — when your partner was pulling back you were kind of lifting the saw out


I SURE AS HELL HATE TO TAKE AL OFF THAT JOB—HIM AN' YOUNG RED ARE A DAMNED GOOD COMBO, AN' I HATE TO BREAK IT UP---THEY GOT THE REST OF THE CREW WORKIN' GOOD, TOO!
YEAH, I KNOW-- SAY! THAT'S OL' PETE OLSEN, THE ★"COLD-DECK" HOOKTENDER-- THE OLD GOAT LOOKS MAD--- I WONDER WHAT'S UP?

THANKS FOR GETTING ME UP HERE WITH YOU, AL!
HELL--IT WOULDN'T BE ANY GOOD WITHOUT YOU, RED!
YOU MUST'VE FIGURED A WAY TO GET THE DONKEY ACROSS THE RIVER!?!
I'VE GOT A FEW IDEAS--I JUST HOPE THEY WORK! I'LL TELL YOU ABOUT 'EM LATER--BUT I'VE GOT TO SEE THOSE FALLERS!
I'VE BLAZED A LINE TO THE RIVER-I THINK WE CAN WIGGLE BETWEEN THE TREES--THERE'S ONLY ONE "WINDFALL" TO CUT, BUT THERE'S TWO CEDARS I'VE MARKED JUST ABOVE THE RIVER--FALL 'EM AND BUCK A 48 FOOT LOG OFF THE BUTT OF EACH OF 'EM!
SHOORE, AL!
★NOTE-


RED, WILL YOU TAKE THE SMALL BLOCK AND STRAP AND HANG IT ON THAT HEMLOCK BEHIND THE BIG FIR--I'LL PULL OUT THE BIGHT OF THE STRAWLINE--WE'LL PUT THE MOVIN' BLOCK ON THE FIR FOR OUR FIRST PULL!
WE'RE READY TO MOVE OUT! HEY DAVE! DID YOU "SHACKLE" THOSE GUYLINES TO ONE OF THE LUGS ON THE BACK OF THE SLEIGH?
YEAH! ALL SET, AL!

Drawings reproduced by permission from Now You're Logging by Bus Griffiths, Harbour Publishing.

of the cut."

Bus particularly enjoyed working in the woods in the winter, when there was no brush on the ground and he could stand on a firm base of six or seven feet of snow and fall timber. He worked on contract and was paid according to the number of trees he felled, and he found he could work faster in the cold weather. "And the snow formed a sound barrier. It was like a blanket. All you'd hear was the sound of the drifting snow."

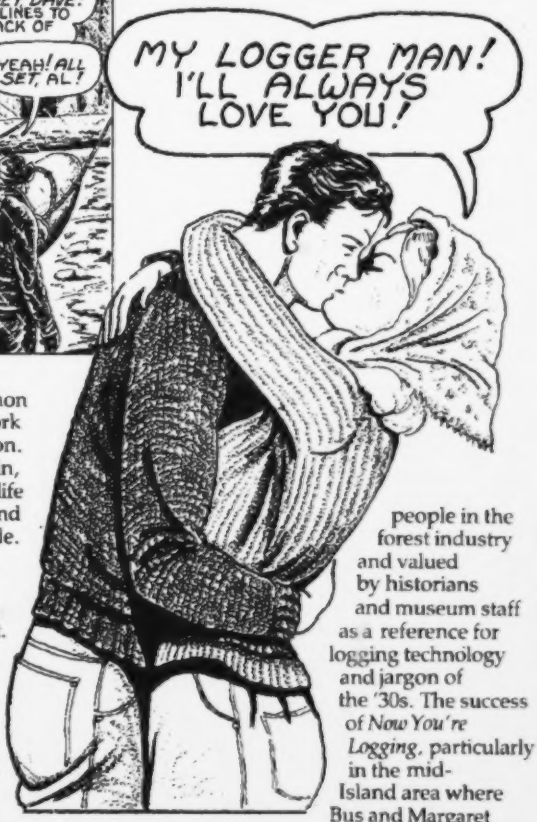
But winter logging also had its drawbacks. Sometimes the extra weight of the snow on the branches would cause the top to break off when the tree hit the ground; and occasionally a logger would fall through a soft spot in a snow drift. "I once fell through into an air pocket that must have been seven feet deep, and I was in a lot of trouble. Finally I pushed some chunks of wood under my feet and was able to scramble out."

Bus's career as a cartoonist began in the early 1940s, when Maple Leaf Publishing Co. of Vancouver, which produced adventure comic books, bought his idea of a comic series about logging in the back woods. Bus had nurtured a dream since early youth of drawing a comic strip, and with his wife Margaret's encouragement, he produced several episodes of a serial he called "Now You're Logging." But Bus found it impossible to carry on with the strip while still working in the woods, and his budding second career went into dormancy. In the early 1960s, Bus bought a troller and became a salmon fishermen, continuing to work in the woods in the off-season. He also started painting again, producing oils depicting his life in the woods and the men and machines of the logging trade. His dream of a comic series resurfaced and he returned to the comic format, adding script and story line to his art.

In the early 1970s, Bus returned to the theme of "Now You're Logging" and decided to produce a full-length historical logging book in cartoon style. "There had been lots of books written about logging, but most of them were by fellows who had never worked a day of their life in the woods," Bus explains. "So I decided to put a little story in it for adventure but also show what the day-to-day logging operations were like and what the different types of jobs were."

The book, which took five years to complete, is the story of two young loggers working at a small west coast truck show during the Depression. With its detailed drawings, descriptions and explanations of logging terms, the book demonstrates step-by-step how loggers of the era felled and bucked timber, topped and rigged spar trees, built log booms and transported steam donkeys across rivers. It's at once a readable adventure story, a series of industrial and natural history drawings and a thorough description of the trade and lifestyle of logging in the '30s. Bus says the characters, particularly the two young loggers and the tough-talking, hard-driving camp foreman, are composites of people he knew in the bush. He even included a romantic interlude between one of the loggers and a young woman, and other sidetrips for salmon fishing and deer hunting, popular leisure activities among oldtime loggers.

The book has sold 5,000 copies, considered a large number for so specialized and unusual a publication. Not surprisingly, it's a favourite among



people in the forest industry and valued by historians and museum staff as a reference for logging technology and jargon of the '30s. The success of *Now You're Logging*, particularly in the mid-Island area where Bus and Margaret live, has made Bud a minor celebrity. He's been called upon to give dozens of speeches and interviews and his work as a painter is in demand.

"I never fancied myself as an artist," Bus admits. "But I took pride at what I could do in the woods. The truth is I got more of a thrill out of laying a big tree just the way I wanted it or shooting a deer or catching a big fish than publishing a book." And he still chases those thrills — out on the salt-chuck with his grandson or deep in the woods with old friends, falling another tree and bucking it up for firewood. "Some people have asked me what it's like to be famous," Bus chuckles. "I tell them I don't know, I just consider myself an old logger."

Bruce Devitt:

Chief Forester, Pacific Forest Products Ltd.
by **Gordon Price**

Bruce Devitt is one of the new breed of chief foresters in British Columbia who spends at least as much time concentrating on how to grow trees as on how to cut them down. In this ForesTalk *interview he expresses deep concern over the rate of reforestation in the province: "We'll have to pay the piper," he says, for not having paid more attention to reforestation in the past.*

As the man in charge of Pacific Forest Products' privately owned forestland, Devitt has a unique opportunity to practise silviculture without government constraint — or assistance. His profile is pushed even higher by virtue of being president of the Canadian Institute of Forestry, one of the major organizations lobbying for a better appreciation by the public of forestry in Canada.

Devitt's interest in silviculture — the growing and tending of trees — dates back to his days as a student of forestry at the University of British Columbia. At that time few foresters specialized in silviculture and, Devitt notes, "until recently the prevailing attitude was one of rationing out the old-growth resource. The emphasis on growing the new crop wasn't there."

Devitt first practised his profession with the old Reforestation Division of the B.C. Forest Service, and in his relatively short career has witnessed the development of a new era in forest management. "We are now coming out of the attitude that the forests are infinite; that the land is infinite." But the priorities of business demand that "growth has got to be the thing that's emphasized.

"You still have to produce a balance sheet that indicates a better return on investment than the year before. But as a silviculturist you have to recognize that fundamentally the resource base is limited. And, without management, so is what you are able to take off the land."

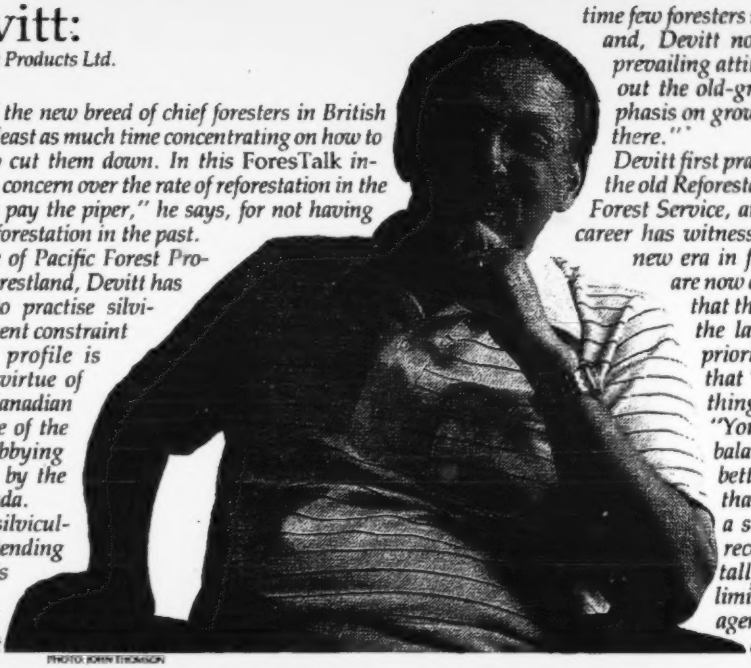


PHOTO: JOHN THOMSON

FORESTALK: What were the silvicultural goals for the province at the time you entered the Forest Service, and how have they changed since then?

DEVITT: You have to realize that when I joined the Reforestation Division in 1957 there was very little emphasis on tree planting; in fact some people believed that all the planting that had to be done in B.C. was already completed. That, of course, was nonsense.

Later, we went through every conceivable way of trying to attain natural regeneration, but finally it dawned on us that we couldn't achieve natural regeneration in the time frames we wanted. Now we know that natural regeneration is not necessarily the cheapest and best way.

So then we went through a terrific expansion in artificial regeneration — from producing 8 million seedlings for planting every year to 75 million. The Ministry of Forests' five-year program today has a target of growing 150 million seedlings annually by 1985. But I can remember thinking 11 years ago — when I was still in the Reforestation Division — that we should be planting somewhere around 300 million a year.

FORESTALK: So why aren't we doing it?

DEVITT: Oh look, we're paying the piper for the lack of appreciation in society in general for what our forest resource is capable of doing for us. It is much nicer to think about other aspects of the forestland base and what they provide for society than it is to think about tree farming.

And it's getting worse. Even in Duncan on Vancouver Island — a forest community living off the resource — a fellow told me that there was more appreciation and understanding of the outdoors in Manchester, England, where he was from than there was in downtown Duncan.

FORESTALK: Surely public attitudes are improving as far as forestry is concerned?

DEVITT: I'm not so sure. I believe we're going to pay the piper in the future too. Today's forestry tools have been gained over a long period of time based on hindsight, people's experience, observation, a bit of research here and there. We don't have that hard, solid research behind our programs.

". . . We're using up our land base indiscriminately, and we don't have a mechanism that determines the best use for a piece of land. We don't even have a land-use ethic in our society. . ."

So while these tools may be adequate to do today's job, where are tomorrow's tools coming from? That's the greatest difficulty we have right now: the lack of attention to developing tomorrow's tools.

Not only that, but we are in danger of losing today's tools. People don't like using chemicals for crop protection; people don't like slash burning for crop establishment; some people don't even like planting because it isn't natural. People certainly don't like clearcutting, yet it permits us to grow the species mix we want. So we're not developing tomorrow's tools and we're in danger of losing today's tools.

FORESTALK: Pacific Forest Products must be fairly unique because it owns its land outright without government tenure involved, such as a tree farm licence.

DEVITT: We're really a microcosm of the rest of the province because we own land just as the province owns its land; in addition, part of our operation includes volume-based Crown tenures. But our company has said that our land will be used for growing trees. I know the land and what it is capable of doing, so I can put together a plan to grow trees to meet our timber supply needs.

FORESTALK: But doesn't that require a lot of money over the lifetime of the crop before you get any return back for your investment?

DEVITT: The amount being spent is really quite small. It approximates seven to eight percent of the total cost of management and harvesting — or about $400 - $500 per acre. The biggest costs don't involve tending the crop; the biggest costs are for harvesting and development.

Without forest renewal and crop tend-

ing there won't be forests to harvest within the needed time frame. And if we don't do it our forests will become like Mother Hubbard's cupboard. The key to forest renewal is to get those trees in the ground so they will survive and grow — something a lot of people don't understand. I'm talking about accountants, auditors, lawyers and those who are suspicious about what's happening.

I had a case on one of our Crown operations where the trees were ready, the ground was ready and there was a situation where, if we didn't plant early, we might have had a lot of seedling mortality. So I said: "Plant. We'll do the paperwork later." Well, at first the Ministry of Forests wouldn't cover our planting costs because we didn't meet one of the checks in its system. Fortunately common sense eventually prevailed.

I can see the concern: taxpayers' money is coming to industry to do silviculture work. But it's not the money that should be audited; it's the growth and survival of those trees that should be audited.

FORESTALK: There is a suspicion that when industry says it's investing so many dollars in intensive forest management, what it is really doing is looking for a way to maintain its current rate of harvest.

DEVITT: Or even to increase it. I think we've made a mistake in calling it intensive management. It's not really intensive; it's basic management. Intensive management is still ten years down the road.

A lot of people don't realize that through crop tending we have the potential to grow the same volumes of trees in 50 to 60 years that we're harvesting today in the old-growth forests. I know it's possible on those lands being harvested right now to grow, within a shorter period of time, at least 150 cubic metres per hectare instead of the 115 currently being harvested.

FORESTALK: Do you base your current cutting rate on the expectation that you are going to achieve that level?

DEVITT: Yes, in part. You have to do a balancing act as you work your way through the mature wood, to give yourself enough time to do the management so that you don't have to shut down.

Most of our tree harvesting in B.C. has taken place since 1945; that means a lot of our crops are 35 years old or younger. And since there might be a 20-year regeneration period in there, some are only 15 to 20 years old (with prompt renewal the regeneration phase can be cut to 10 years). So you're going to have a dip in your timber supply before those new trees are ready to be harvested — you can't help it.

And everybody is in the same boat right now: in the Pacific Northwest, in Scandinavia, everywhere in the world.

FORESTALK: One can't help but say that there was a fundamental error in planning by industry and government.

DEVITT: By our society. I can take you back to 1900 and show you where foresters were talking about the things that needed to be done. But no one was listening.

FORESTALK: Perhaps one of the reasons no one was listening was because the foresters assured them that the province was operating on a sustained yield basis.

DEVITT: "Sustained yield" is an unfortunate term. To me, the old sustained yield calculations were strictly a rationing process for the old-growth forests. The allowable cut — or rate of harvest — should be a pulsating thing, subject to economics, politics, society's pressures, and management inputs. It's not fixed.

FORESTALK: Are we making mistakes now that we're going to have to pay for later?

DEVITT: We could be. It's fairly obvious certain things are going to happen: environmental concerns and energy costs are going to increase — so we've got to find some alternative energy sources. We're using up our land base indiscriminately, and we don't have a mechanism that determines the best use for a piece of land. We don't even have a land-use ethic in our society. That needs to be resolved.

". . . we're paying the piper for the lack of appreciation in society in general for what our forest resource is capable of doing for us. It is much nicer to think about other aspects of the forestland base and what they provide for society than it is to think about tree farming. . ."

We know that because most of the harvest has taken place since the war, our tree sizes are going to be smaller. So we have to do something about the technology to handle these smaller sizes.

FORESTALK: Aren't the company managers finally coming to you, the silviculturist, and saying: "Bail us out. Give us the increased wood supply that we're going to need to stay in business."?

DEVITT: There is no magic green wand, but we're trying to generate enough wood to plug the 20-year gap between the old-growth harvest and the tended stands. Sometimes even when we know there is going to be a "falldown" in timber supplies, we have to look at today's situation. We can't go and say, "Bam, we should be cutting only 250,000 cubic metres of wood annually instead of 400,000." That might mean you have to lay off contractors as well as cut back your own crews. That would cause so much disruption in the community that it's not viable. You have to face it over a long period.

FORESTALK: Are you phasing down your rate of harvest?

DEVITT: Our plans include reducing our harvest rate down to the level where we can buy some time. But it's difficult.

FORESTALK: So what's in the future? Do you have any new projects planned?

DEVITT: Basically our chore over the next 10 years has to be to refine our silvicultural tools. But it needs more than just one company to be involved in the research, to make sure there are enough people going through the technical schools and universities to provide the human resources to manage the forest better.

Everybody is concerned about proper inventory of the resource, though B.C. has one of the best in the world. In three years' time they're going to have a pretty good system in place using satellites, high-and low-elevation photography and ground checks. At the end of the year you'll get your inventory, you'll know how many acres have been harvested, what the rate is and what effect it's having. Your land withdrawals will be built in and you'll push another button and you'll have your map.

That's great. Then we can react to things on a yearly basis instead of having to wait 15 years to find out there's been a mistake made.

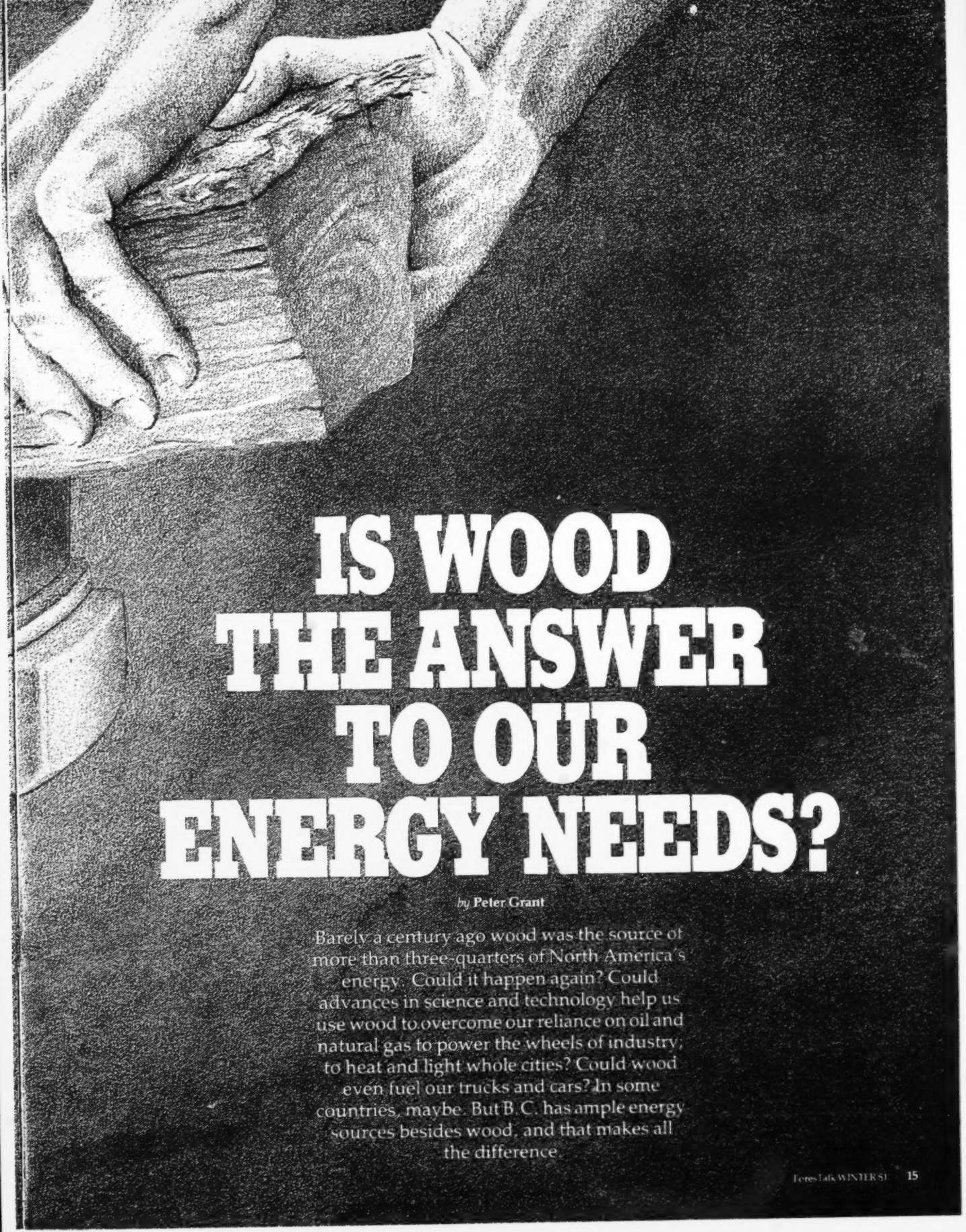
FORESTALK: What kind of improvements are you looking for specifically in silviculture?

DEVITT: There's about a 15 percent difference in growth potential between planting a tree poorly and planting it properly — just the attention to stock handling from the nursery to putting it in the ground at the right time.

We did a simple thing. We site-mapped our areas and we now plant our dry sites first in the spring and we plant our moist sites last. We got a 15 percent increase in survival by that simple technique. The reason we got that was because we know our land base. But anyone can do it.

Sure, the future is always uncertain. But there are a few things we know are going to happen — and we should be concentrating on those things today. It's like crying in the wilderness to try and get people to sit up and take notice.

If society says to me as a forester that it wants to use the land for environmental aesthetics, water protection or whatever, I can take the science and technology available and put together a management plan. But I can't make the decision for society. There has to be some group consensus, and we don't have a mechanism in place for that.



IS WOOD THE ANSWER TO OUR ENERGY NEEDS?

by **Peter Grant**

Barely a century ago wood was the source of more than three-quarters of North America's energy. Could it happen again? Could advances in science and technology help us use wood to overcome our reliance on oil and natural gas to power the wheels of industry, to heat and light whole cities? Could wood even fuel our trucks and cars? In some countries, maybe. But B.C. has ample energy sources besides wood, and that makes all the difference.

The year is 2011. A popular magazine features an article titled, "Now You're Cooking, Skoglandia." It outlines the country of Skoglandia's 30-year campaign to develop wood as an energy source to meet half of its energy needs.

Back in 1981 Skoglandia finally realized it had an energy-supply problem; it was virtually going broke importing huge amounts of oil and natural gas.

A national conservation effort aimed at fully insulating all buildings and improving the efficiency of car and truck engines was helping, but these efforts weren't enough to offset the swelling price of fossil fuels. Besides, the demand for energy was projected to grow — in spite of the conservation effort. So a special fact-finding task force was commissioned to tour the world to discover how Skoglandia could make better use of its extensive forest resources to provide the energy needed for heating, transportation and industrial power.

Since the B.C. pulp and paper industry already used wood to provide almost half of its energy needs, British Columbia was the commission's first stop. For over 75 years the province's forest industry had been generating steam by burning both waste wood from sawmills in big "hog fuel" boilers and the spent "liquors" from pulp mills in recovery boilers. The steam from the boilers was used for heating plants and offices, for drying lumber and, by running it through turbines, for generating electricity. To the Skoglandians, this was a big step in the direction of energy self-sufficiency.

In Brazil the commissioners found the forest industry had gone a step further: several pulp mills were already completely self-sufficient in energy. One company even created steam power from the slash left over from logging operations; large mobile chipping machines ground up the residues which were then blown into huge vans and delivered to the pulp mill's boilers — for the same cost as importing fuel oil.

The task force was then astounded to learn that a small city in the United States — Eugene, Oregon — had been supplying part of its own energy needs from wood since 1941. Here, hog fuel purchased from nearby sawmills and logging sites was burned in big boilers. The hot steam was used to heat downtown office buildings, the local college, a hospital, dairy plants and a cannery. The same steam drove electric turbine generators, which lighted most of the city's homes and offices.

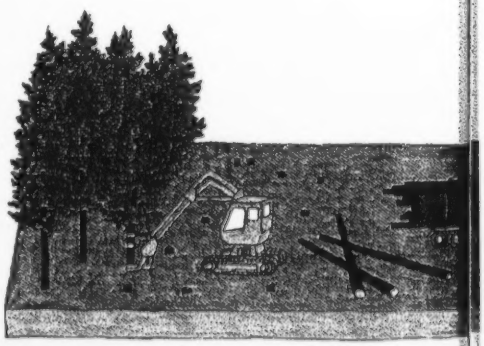
Some Oregon mills with similar plants had another interesting arrangement: they could sell their surplus electricity to the local power authority — at the same price as they would pay to buy electrical power.

The commission realized that cogenerating heat and electricity worked well in large operations, but hog fuel boilers were too expensive for small towns or out-of-the-way sawmills. Yet it was these very sawmills that produced most of the wood waste. How could this waste be converted into fuel? The commission found that answer in dozens of small mills in the United States and Canada, where wood burners were used to dry lumber and veneer. Developed in the 1960s and 1970s, these "direct-fired" burners were small and efficient. They didn't need much supervision, and some of them could burn everything from sticks to wet sawdust. A few, like the "fluidized-bed combustor," could even burn municipal garbage.

But burning wood waste had its problems: the material was bulky, it didn't transport easily, and it delivered very little energy for its mass. The commission found a solution to these drawbacks back in Oregon, where a company compressed wood waste into pencil-shaped pellets. These pellets could deliver about the same heat value as low-grade coal — at half the cost.

So far, so good, the commission reported: wood waste could provide cheap heat and electricity wherever the waste supply was close to the energy demand. Next was a bigger challenge — finding a way to use wood as a fuel for automobile engines. More surprises were to come. Converting wood and other biomass (vegetable matter) into fuels for engines turned out to be old hat. One of many conversion methods was gasification: burning wood without enough air for complete combustion in order to make a combustible gas and a thick oil. One U.S. company had set up more than 600 wood gasifiers in the 1920s and 1930s, one of them on Vancouver Island and many in remote parts of Africa, where it was difficult to get cheap fuel and where there was no electricity. The wood gas usually served as fuel for an accompanying electric generator.

Like hog fuel, however, wood gas, whose energy value is only a bit more than one-tenth that of natural gas, is not cost-efficient if it has to be transported any distance. The commission felt other biomass-based fuels looked more promising. Ethyl alcohol, for example, is produced from fermenting wood. A similar liquid, methanol, can be synthesized by various complicated methods (the best known starts with wood gas). Both fuels can also be made from other vegetation, such as sugar cane and grain, and these fuels are more than adequate for auto engines — the Germans ran their army



Efficient Forestry

In the year 2011 Skoglandia's harvesting practices are so efficient that very little waste is left on the forest floor; all useable wood fibre is trucked to the saw mills and pulp mills.

on methanol for much of World War II. Moreover, alcohol is cheaper to produce than gasoline, at least in large amounts.

Brazil, the task force learned, had started a methanol-producing program in 1979. Like Skoglandia, Brazil had no oil of its own, but Brazil's remarkably fast-growing forests were being used for energy production. The government had developed a whole region as a biomass supply base and had built huge plants to convert sugar cane and wood to methanol. At the same time it developed a car engine that could run solely on this biomass-based fuel.

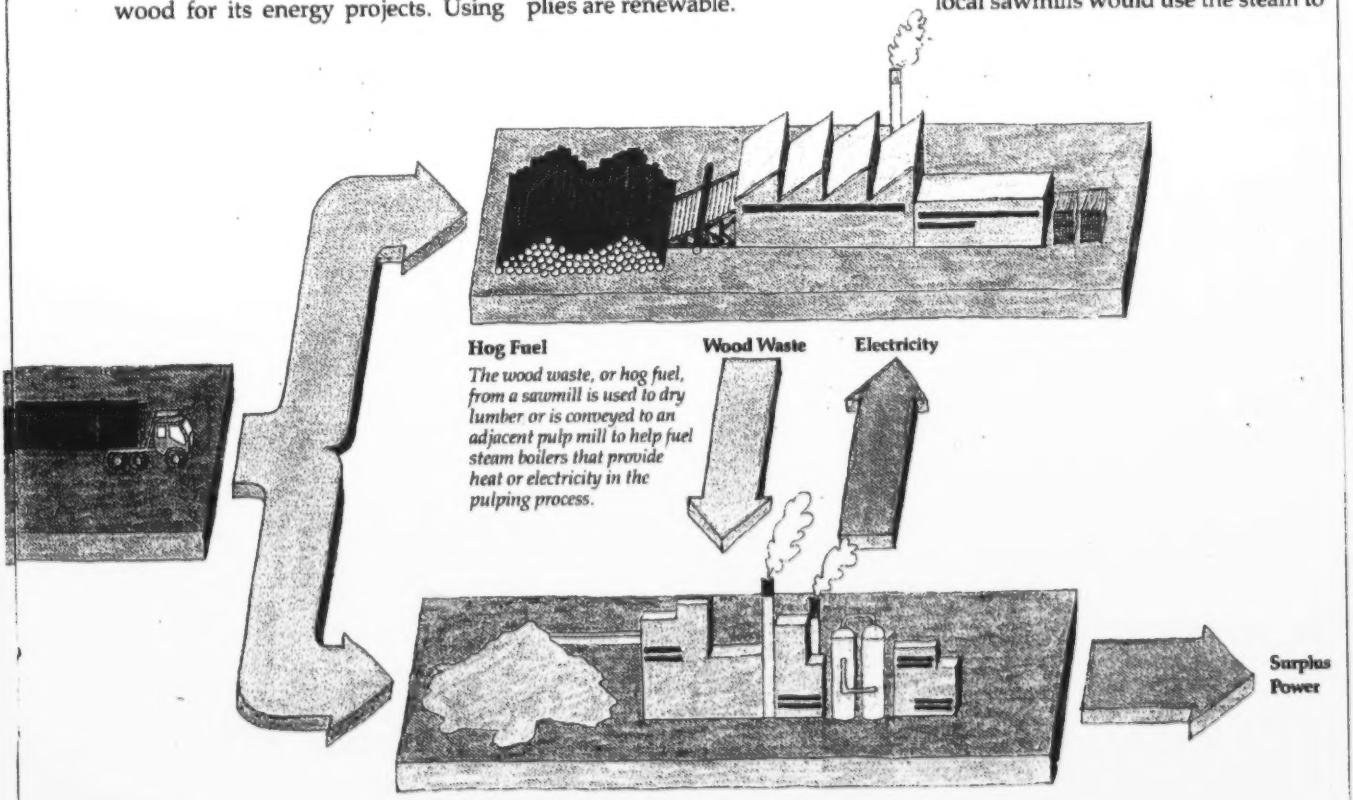
Skoglandia still had one more problem to solve: Having planned to convert to burning wood waste for much of its energy needs, it now wouldn't have enough wood waste left over to make methanol fuel! The country needed much more wood for its energy projects. Using merchantable timber was out of the question, of course; it was much more valuable as lumber or pulp.

The commission visited a university in Sweden to look at experiments with hybrid varieties of poplar and willow. These genetically-improved strains were growing ten times faster than the average softwood forest, and on poor sites at that. In these "energy plantations," small cuttings planted several centimetres apart grew to a height of five metres in just two years. Within days after harvesting, new shoots grew out of the stumps. Canadian scientists were getting much the same results with growing hybrid poplar on abandoned farmland in Ontario.

Thanks to those energy plantations and to what used to be called waste wood, Skoglandia now gets more than half of its energy from wood. The world may be running out of fossil fuels, but this country's energy supplies are renewable.

Back in British Columbia, 1981, the belief that wood can help solve our energy supply concerns has prompted growing numbers of individuals to burn wood in airtight fireplaces to cut down on home oil and electricity heating bills. But homes account for only 15 percent of B.C.'s total energy consumption, and home fireplaces don't even make a dent in that statistic. B.C.'s industries, on the other hand, use close to 50 percent of all energy consumed in the province; major shifts in B.C.'s energy-use pattern would result if industry adopted wood as an energy source. And this possibility recently has attracted widespread interest. Consider these proposals:

* The use of surplus waste wood from five sawmills around Quesnel to fire a 50-megawatt plant that would cogenerate heat and electricity. The local sawmills would use the steam to



Hog Fuel

The wood waste, or hog fuel, from a sawmill is used to dry lumber or is conveyed to an adjacent pulp mill to help fuel steam boilers that provide heat or electricity in the pulping process.

Energy Self-Sufficiency

The pulp mill's wood-burning boilers provide heat and run turbines to generate electricity for the sawmill and pulpmill. Surplus power is fed into the country's power grid.

heat their lumber-drying kilns, and the electricity would feed B.C. Hydro's transmission grid.

* The construction of four thermal generating plants on Vancouver Island. Logging residues, ground and shipped to the strategically-located plants, could power generators to provide additional, badly-needed electricity for the island.

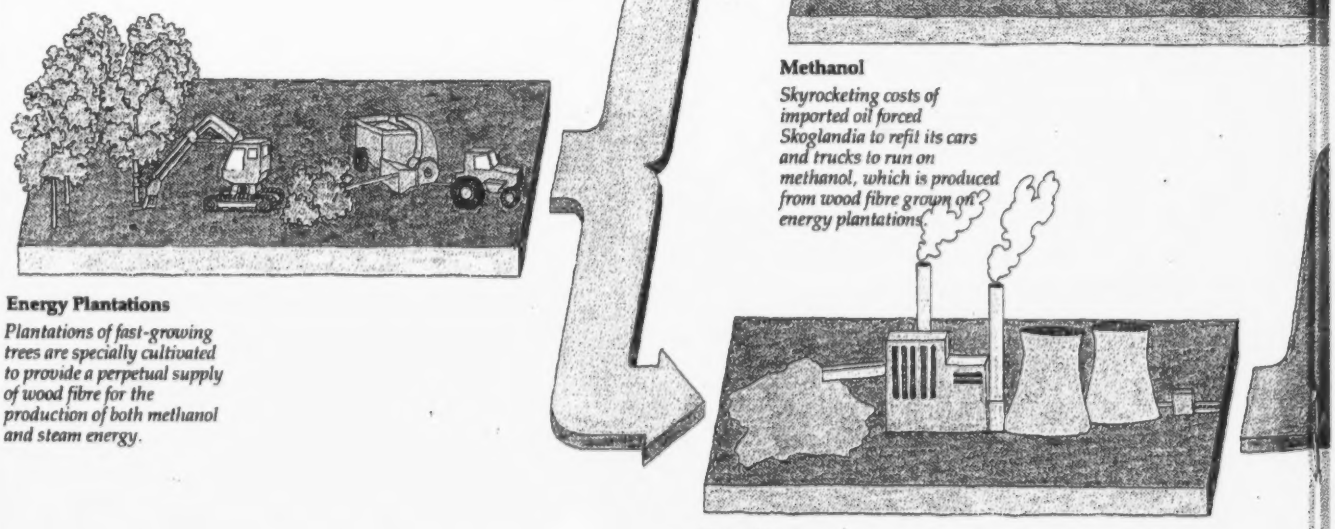
* The heating of downtown Vancouver office buildings with piped-in steam generated by a fluidized-bed combustor. The unit, originally intended for the False Creek foreshore, could burn either hog fuel barged in from Fraser River delta sawmills or municipal garbage.

Creative ideas for turning waste wood into fuel are plentiful — almost as plentiful as B.C.'s mill wastes, which are currently piling up at the rate of about 66 million cubic metres a year. About half of that is burned as hog fuel by the forest industry to generate steam and electricity. The rest is surplus. As energy, that's the equivalent of about 11.5 million barrels of oil. In addition, there are millions of cubic metres of slash left behind on B.C. logging sites every year; just how much is left is the subject of an ongoing study by the Canadian Forestry Service.

Most wood energy projects are in early stages of development, but they all share a common objective: "We are so dependent on oil and gas that we have to investigate all potential forms of energy," says Vancouver forestry consultant Paul Jones. "We're looking at all our options — solar and wind power as well as energy from biomass." Federal research incentives, such as the six-year, $288-million Forest Industry Renewable Energy (FIRE) program and the Energy from the Forest (ENFOR) program, support projects investigating such things as the cost of collecting and hauling logging slash and the efficiency of wood-burning hardware.

Meanwhile, all-out conservation, — a habit Canadians haven't yet acquired — could reduce future demand for energy, or at least reduce the *growth* of demand. Tough new building codes (including more stringent standards for lighting and insulation) and higher fuel economy standards on new cars are expected to reduce the rate of B.C.'s oil imports. And in the coming decades the energy-intensive forest industry will be expected to become more energy efficient. Canada's pulp and paper industry, for example, is aiming for a 30 percent improvement in energy use by 1985.

Given all this activity, and a huge supply of wood waste to draw on, it seems at first glance that wood could lead B.C. into an energy self-sufficient future. In realistic terms, however, the use of wood for energy will likely expand modestly in the coming decade, and only within



Energy Plantations

Plantations of fast-growing trees are specially cultivated to provide a perpetual supply of wood fibre for the production of both methanol and steam energy.

Methanol

Skyrocketing costs of imported oil forced Skoglandia to refit its cars and trucks to run on methanol, which is produced from wood fibre grown on energy plantations.

Steam Power

In communities close to energy plantations, wood-burning steam plants provide heat for much of the city; the steam also drives turbines that feed electricity into the country's power grid.

the forest products industry where hog fuel is already widely used and supplies are nearby. Energy experts see several trends to the wider use of hog fuel:

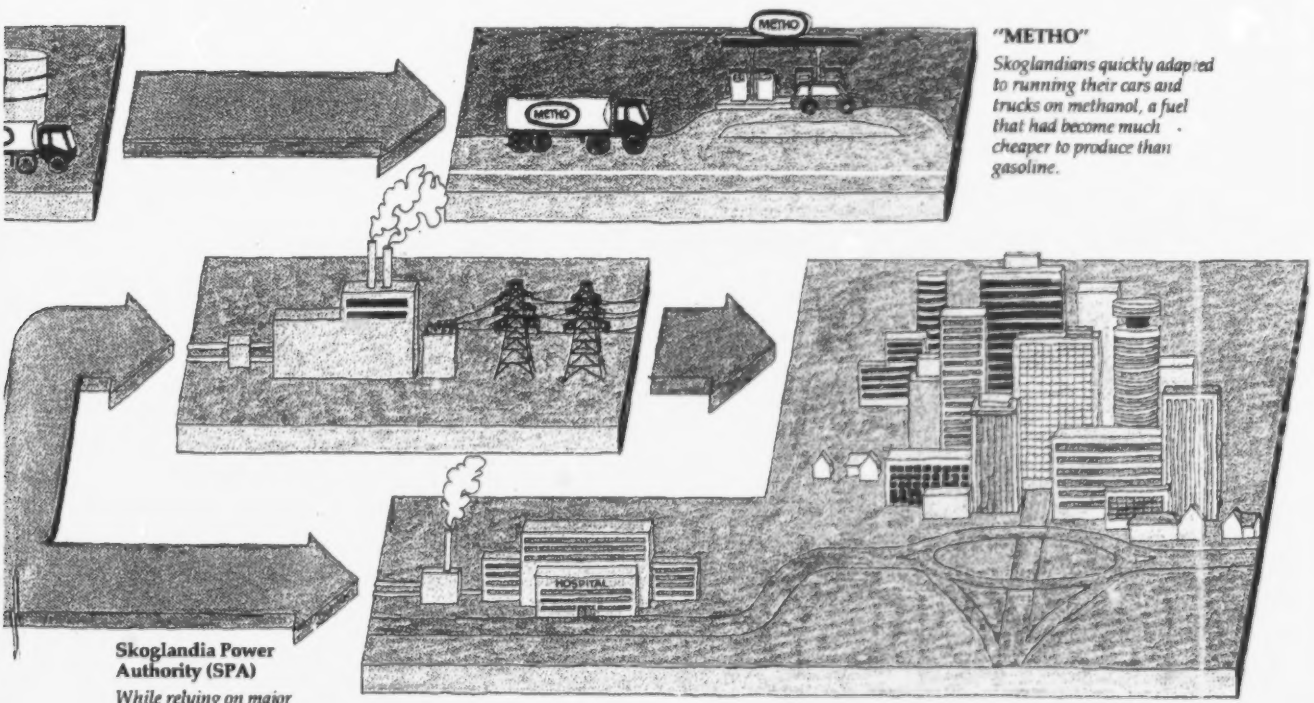
* More of B.C.'s pulp mills will fire boilers with hog fuel, instead of oil or natural gas, to cogenerate steam and electricity. So far, only a minority of the province's 24 pulp and paper mills use wood for energy, but several on Vancouver Island have recently switched from oil to hog fuel, and several more conversions are in the works.

* Kraft pulp mills also ring up big fuel bills in the process of treating lime in huge rotary kilns. (The lime is needed to help produce "white liquor" — the agent that breaks down wood chips into pulp). Since an average-sized pulp mill needs about 100,000 barrels of oil annually just to operate these kilns, the lime kiln at the MacMillan Bloedel Port Alberni plant, which replaces oil-fired equipment with a hog fuel burner, is attracting considerable interest. The unit, a "wet-cell burner" designed and built by Lamb Cargate Industries of New Westminster, is the first to be put to this use. If it proves cost-effective, B.C.'s kraft pulp mills could cut their huge oil and natural gas consumption almost in half by converting to this wood-burning equipment.

* If lime kilns can be fuelled by wood, so can the many lumber-drying kilns in B.C. sawmills. So far only half-a-dozen mills have converted to the direct-firing burners required to do the job. A Lamb wet-cell unit at the Plateau Mills sawmill in Engen provided such good gas savings, the mill purchased a second Lamb burner to provide heat for four more kilns as well as build heat for the sawmill and planer mill.

The potential savings in converting lumber-drying kilns from fossil-fuel-burning equipment are enormous: almost 10 billion cubic feet of natural gas a year. For the interior sawmilling industry in particular, this represents by far the greatest potential for replacing fossil fuels with wood waste as an energy source. This is the opinion of Bruce Levelton, the Vancouver consultant whose publication, *Evaluation of Wood Waste Energy Conversion Systems*, is considered by people in the industry to be the last word on the subject of converting biomass into energy.

Beyond these examples, however, the use of wood as an energy source in B.C. will be tied to the shifting economics of buying fuel. In most parts of B.C., Levelton says, it's expensive for a company to convert its energy-supplying equipment; the common boilers and burners are made for liquids or gases rather than a solid fuel like wood. Moreover, B.C.'s abundant supplies of hydroelectric power and natural gas — and their still comparatively modest prices — make it more economic to continue buying



"METHO"

Skoglandians quickly adapted to running their cars and trucks on methanol, a fuel that had become much cheaper to produce than gasoline.

Skoglandia Power Authority (SPA)

While relying on major hydro-electric projects for much of its power, SPA makes good use of the electricity generated by turbines driven by wood-fed steam boilers.

Steam Heat

Wood-generated steam that has already driven electricity-producing turbines is used to heat major buildings in nearby communities.

The Energy Supply

It still uses a lot of imported gas and oil, but in 2011 Skoglandia is supplying over half of its energy needs from wood.

these energy supplies than switching to wood. The economic picture could change almost overnight, however, and in some parts of the province it has already proven economic to switch to wood energy. For example, the Clearwater Lumber mill in Vavenby used to import expensive butane from Alberta to fuel its drying kiln, as natural gas wasn't readily available in the North Thompson area. Ever since the company installed an Energex suspension burner and switched to burning shavings, it has enjoyed considerable fuel cost savings.

But there's another trend at work which in the long run could affect B.C.'s waste wood surplus much more than the growing demand for it as a relatively cheap fuel: the search for ways to use more of a tree's fibre to make saleable products. Much of the sawdust that was once burned in teepee or beehive incinerators now ends up as particle board, for example. Other wood wastes can be used as pulp furnish. If this trend results in reduced supplies of hog fuel, it's not likely to worry many people. "It's a good sign that the forest industry recognizes the value of wood for product rather than for fuel," Paul Jones comments.

When the experts total up B.C.'s potential energy production from hog fuel and forest residues, they don't get too excited. Hog fuel and black liquor at present account for less than four percent of B.C.'s total energy supplies. At best, that figure could double in coming decades, says Glen Manning, program manager for economics at the Pacific Forest Research Centre in Victoria. Wood energy has more potential in Ontario and Quebec, where a lack of natural gas, combined with escalating oil prices, have encouraged the installation of a variety of waste-burning systems.

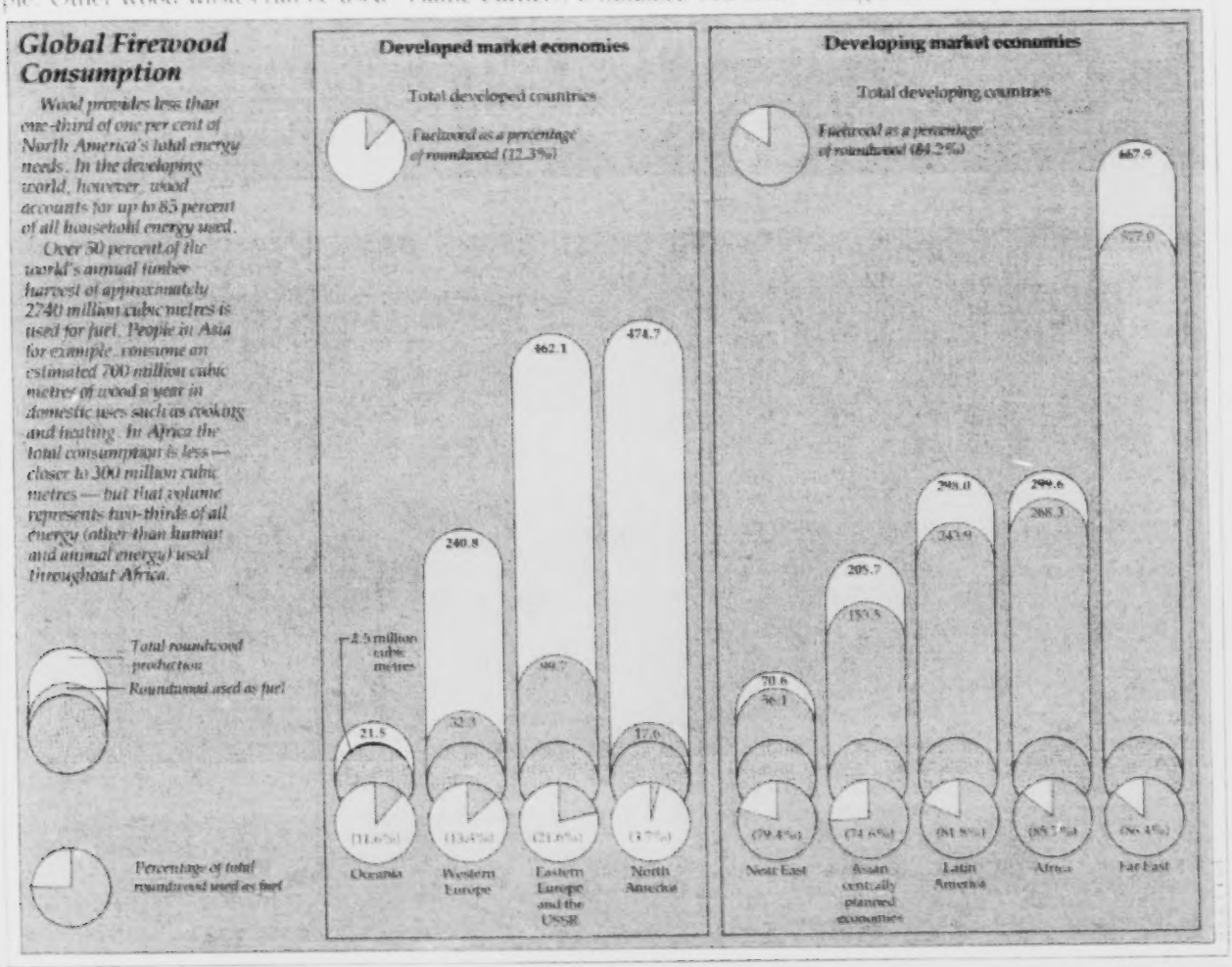
In Quebec City, a district heating plant burns garbage; two sawmills in Quebec recently installed new Fluid Flame burners, a fluidized-bed combustion system as yet untested in this province. As well, methanol production from biomass plantations is under active research in Ontario, and a Winnipeg-based company is aiming both to produce methanol and to convert drivers to its methanol-powered cars. If methanol has a future in B.C., natural gas — not wood — is much more likely to be used as the feedstock.

Every province's and every country's solution to the energy squeeze is likely to be unique. Countries as different as Sweden and Brazil may end up relying on wood and other biomass for most of their energy needs, whereas B.C., despite an available waste wood supply, is more likely to develop other energy sources first. But the sense of crisis that followed rising oil prices in the 1970s has yielded this pay-off: looking more closely at our wood supplies and our energy sources, we're discovering the best ways to use them.

Global Firewood Consumption

Wood provides less than one-third of one per cent of North America's total energy needs. In the developing world, however, wood accounts for up to 85 percent of all household energy used.

Over 50 percent of the world's annual timber harvest of approximately 2740 million cubic metres is used for fuel. People in Asia for example, consume an estimated 700 million cubic metres of wood a year in domestic uses such as cooking and heating. In Africa the total consumption is less — closer to 300 million cubic metres — but that volume represents two-thirds of all energy (other than human and animal energy) used throughout Africa.



LETTERS

Please Don't Lose Your Balance

I was a bit disappointed by your article "Catching Up and Moving Ahead" in the Summer 1981 issue of *ForesTalk*. I felt the article underplayed the extent of the NSR backlog (denuded forestland not sufficiently restocked with new trees), especially in the graph which had no scale on the vertical axis and which was chopped to visually emphasize the portion of NSR being dealt with. If the public and the industry are going to be presented with the bills for expensive NSR planting it would be far better to prepare them with a realistic picture of the problem, rather than the "whistle in the dark, things-will-be-better-in-1986" tone of this article.

I hope in future you will examine the problems and issues in reforestation with more candor; nursery shortfalls and die-offs, pesticides, the failure of eight years of Douglas fir planting on the Island, planters vs. I.W.A. The forestry world is not all scenic splendor and wonderful cooperation. Please, don't lose your balance.

Bob Ploss
Vice President
Pacific Reforestation Worker Association
Slocan Park, B.C.

Sagebrush-off

"The Great Ponderosa Pine" photo essay in the Summer 1981 issue of *ForesTalk* states: "The open parklands of the ponderosa forest are full of the brilliant yellow blooms of sagebrush, buttercup and balsam root, and the rose-pink flowers of bitter root."

While rabbitbrush blooms are rich yellow in the fall, the sage puts out a tiny, nondescript flower. Someone must have been dazzled by the Okanagan sunshine!

Angie Waterman
South Okanagan Naturalists Club
Penticton, B.C.

What we were trying to describe were the yellow blooms of the prickly pear, but somehow the sentence never quite got there.

Nixon Challenged

Unfortunately in your summer issue interview section you chose to highlight a comment by Bob Nixon of the Sierra Club, which is a misrepresentation of the forest industries' position with regards to wildlife management. Featured was a statement which says that "industry has no responsibility for wildlife in the forests." This leads Mr. Nixon to simplistically conclude that therefore industry obviously refuses to take the broader view of forest management.

The purported quote is, I suppose, extracted from a paper which I gave at a recent wildlife conference in Victoria where I clearly stressed that *industry unfortunately has no legal mandate* to manage wildlife resources. It is apparent that Mr. Nixon did not find it in his own interests to repeat my comments that industry is prepared to assist, and is assisting, in the protection and enhancement of wildlife values by implementation of techniques which are known to be in the public's best interest. Also avoided was my strong recommendation that the Fish and Wildlife Branch support a trial in which a portion of industry would undertake to manage a Tree Farm License in which the wildlife resources would be part of the overall management mandate.

I went on to promote the team approach to the management of all forest resources, particularly the integration of wildlife and forestry. I am convinced that adoption of such measures would eliminate the adversary situation in which we sometimes now find ourselves. Mr. Nixon does integrated resource management a disservice by trying to portray industry as both uncaring and unwilling to take a broader view of forest management.

I would also take issue with Mr. Nixon's statement that the economic values derived from second growth forests will be far less than from old growth. While that statement may be true with reference to the relatively scarce stands of accessible high quality timber found in the province, the overall stand quality of the forests produced as a result of forest farming will be of much higher quality than the remaining typical old growth stand.

D.E. McMullan, R.P.F.
British Columbia Forest Products
Crofton, B.C.

Metric Double-Play

Usually I enjoy my copy of *ForesTalk* before taking it home to my family, or passing on a particular article to a neighbour, friend, or relative. The stories are informative, and the color illustrations are superb.

However, your "Good Wood" item dealing with baseball bats in the *Collections* section of the Summer 1981 issue did not make a hit with me. I think you are away off base publishing, for a government committed to metric conversion, imperial units of measurement without:

a) Showing any SI metric units, and
b) Showing the metric *first*, and any imperial units subsidiary to the metric.

It was a foul thing to do!

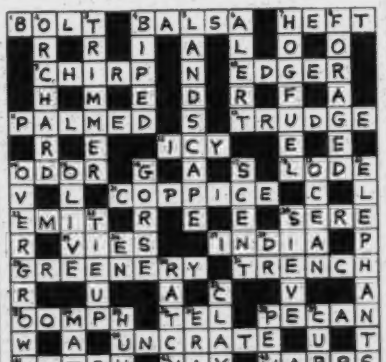
Herb Adams
Metric Coordinator
Pacific Vocational Insitute
Burnaby, B.C.

Most baseball fans would leap to their 60.96 cm (feet) to defend the imperial right of baseball. So ForesTalk *chose to play it safe. Was that an error?*

Cross-Canada Compliment

I enjoy your seasonal magazine very much. In fact I think it is the best-presented forestry magazine anywhere. The Gold Quill Award of Merit is well-deserved, and your staff should be commended for their excellent presentation of the practice of the science of forestry to professionals and laypersons alike. I hope other provinces view this publication with interest and display their forest wealth as vividly and colourfully as British Columbia does.

Richard A. Kelertas, R.P.F.
Toronto, Ontario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GREENERY TRENCH
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COMPH TEL PECAN
W A UNCRATE U T
NOTCH HAY WARPS

Answers for ForesTalk Crossword (see page 25)

MOVING?

Please let us know.

Ms/Mrs./Mr. _____
Name (please print)

New Address _____

City Postal Code

MAIL TO:

ForesTalk
Information Services Branch
Ministry of Forests
1450 Government St.
Victoria, B.C. V8W 3E7

Letters to the editor provide an opportunity for our readers to discuss topics arising out of ForesTalk. Letters for publication must carry the sender's name and address. Views published are not necessarily endorsed editorially. ForesTalk reserves the right to edit for publication.

Sitka Spruce:

First Against the Sea

A photo essay by
Gary & Judy Green

Stretched along the U.S. exposed outer coast is a remarkable display of growth: the Sitka spruce, first line of defense against the onslaught of a restless Pacific.

Contorted and twisted, Sitka spruce head list on exposed rock headlands. Here, where land and sea meet, the spruce forest is a living shield protecting the less hardy species of conifer, the red hemlock.

Hauntingly somber, the spruce forest is unique. Trees rise from a tangled mat of still, moist fog draped in images of graceful lichen wave in the wind.

Overhead a bald eagle soars, catching the uplifting winds of a churning sea, looking for food right for from on the rocks below. Hundreds of pigeon, Steller jays, and crows fill the coastal forest.

At the water's edge are the tide pools, highlighted by the brilliant colors of sea anemone, starfish, clinging barnacles, and the forest of sea kelp, most often just beyond reach of what the receding sea has to offer.

Further inland the Sitka, the tallest member of the spruce family, reaches heights of up to 92 metres. Unlike its stunted counterparts on the open coast, the inland Sitka spruce is a massive tree. Its strong, resilient wood has caused it to be highly valued.

The Sitka spruce can be easily identified by its stiff, sharp needles, which are painful to the touch, and by its bark, which consists of silver to purplish-gray scales.

Life is hard on the open coast where the Pacific pounds away at the land. Yet this is where the Sitka spruce likes to stand.

COLLECTIONS

It was so cold!

Jack Hicks of Langford, B.C. remembers the two winters he spent in a logging camp in the Alberta foothills in the early 1920s: "All the work was done with horses. Some of the contractors had two or three hundred of them." Mr. Hicks, then 20 and just out from Ontario, was a teamster, handling and driving a team of four horses. "I worked ten hours a day, six days a week — seven days if there was no barn boss.

"It was pretty rugged in the camp. There were no mattresses on the bunks. You had to rustle up a little bit of hay or some balsam brush, and you supplied your own blankets. It was cold; we worked in fifty below zero cold. You had to take your boots to bed with you, otherwise they'd be full of frost in the morning."

The loggers used sleighs to haul the jack pine logs to the mill and to the railway across the Saskatchewan River. Three-man teams loaded the big sleighs with the aid of horsepower and a clutch of special tools — swamp hooks attached to chains for grappling the logs and cant hooks (something like a peavey) to position them. "The top loaders were so good," Mr. Hicks says, "they could put on a load almost vertical, and there were no stakes on the sleigh. And the log ends would be absolutely even."

Snowfall was light and dry in the foothills, so the contractors had to build sleigh roads. "They used the sleigh to plough two ruts the length of the road, then they filled the ruts with water from the river until there was an inch and a half of ice in them." To keep the sleighs from running away on hills, a teamster would throw sand under the runners. "It was quite an art to know exactly how much sand to use. Too much, and the friction would heat up the runners, and they'd freeze into the ice." Once the loaded sleigh reached the millsite, a winch would haul the whole load, sleigh and all, up the incline on an elevated carriage track which kept it all level.

Mr. Hicks later moved on to British Columbia: "Word got around that conditions were much better in B.C." He was barn boss for a logging operation near Yahk that used 250 head of horses. And although it has been a long time since his horse logging days, Jack Hicks remembers them well.

THE YULE LOG

In days gone by, the Yule log was a centre of attention on Christmas Eve in households all over England, France, Germany and the southern Slavic countries. Several people would lug a huge piece of oak or yew, cherry or plum into the house and set it in the hearth. Once lit the log was kept burning through the twelve days of Christmas, and the family offered prayers for prosperity in the coming year. In the French cantons of Switzerland they sang this song:

May the log burn!
May all good come in!
May the women have children
And the sheep lambs!
White bread for everyone
And the cat tail of wine!

After the Christmas season the family kept the remains of the Yule log. A fragment would be stored under a bed and quickly rekindled in a thunderstorm as a talisman against lightning strikes (the Yule log custom has its origin, apparently, in an ancient mid-winter fire festival). The ashes of the log might be added to the water the cows drank to make the cream thick, or sprinkled over the chickens to make them lay. Plowmen would use an unburnt piece of the log as the wedge in their plows, to make the seed thrive at sowing. Come the following Christmas Eve, the new log was kindled with a remnant of the old, to preserve (touch wood) the circle of good fortune.

WINTER SURVIVAL

The trees covering Canada's northland and alpine regions use a number of tricks to keep from freezing to death in the bitter winter cold.

At the first signs of winter most trees go dormant. They pack up their growth processes and "sleep" until longer warmer days announce the coming of spring. But they have to keep some water in their systems for sustenance, and if the water in a plant's cells freezes, the cells are as good as dead.

To prevent stored water from freezing, some trees can supercool it down to temperatures as low as -40°C by a little understood process that has an effect similar to that of putting salt in cooling water that is much more powerful: the water stays in liquid form far below its usual freezing point. One study found that some 70 species of hardwood trees native to eastern Canada have this kind of frost-hardiness, but it is not known whether B.C.'s hardwoods or evergreens share this characteristic.

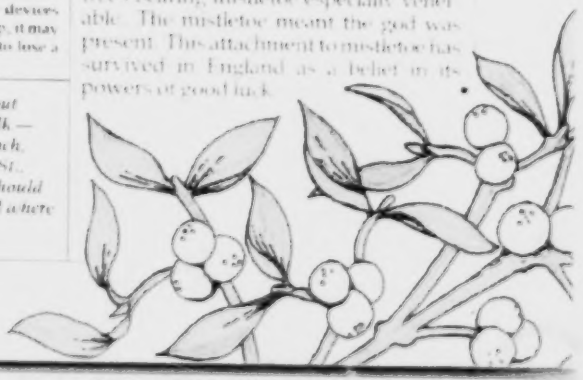
Another trick trees use to protect their cell tissue is to develop an insulating outer coat of ice. The very act of freezing draws water out of the cell structure to provide added insurance. Coniferous trees can also rely on a covering of snow to insulate them against deep cold. And, if all these devices can't keep a tree's cell water from freezing up, it may still have a tolerance for injury — be able to lose a few branches but still survive the winter.

Do you know any interesting facts about forests? Mail submissions to: ForesTalk — Collections, Information Services Branch, Ministry of Forests, 1450 Government St., Victoria, B.C. V8W 3E7. Information should be brief, accurate, and sources included where possible.

SACRED GROVES

The Germans developed the forestry systems we practise today, and a glance at ancient history explains why — their ancestors worshiped trees above all things. Across the forestlands that once stretched in an unbroken line from northern France to northern Greece and Russia, the Celtic, German and Scandanavian tribes all had sacred spots in the forest where they worshiped local tree-gods.

Roman writers in the era when Julius Caesar was conquering Gaul noted that the sacred grove most often was within a circle of oak trees. The oak was the supreme tree, home of the preeminent god of the Druids. The Druids used oak leaves in all their rites and thought oak trees bearing mistletoe especially venerable. The mistletoe meant the god was present. This attachment to mistletoe has survived in England as a belief in its powers of good luck.



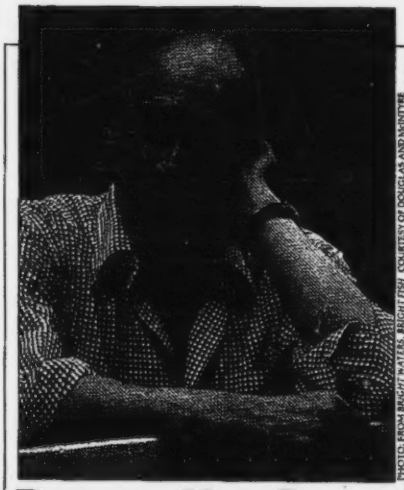


PHOTO FROM BRIGHT WATER BROTHERS, COURTESY OF DOUGLAS AND McINTYRE

RODERICK HAIG BROWN

"I have never yet seen a river that I could not love. Moving water . . . has a fascinating vitality. It has a thousand colours and a thousand shapes, yet it follows laws so definite that the tiniest streamlet is an exact replica of a great river."

B.C.'s best-known naturalist and one of its first environmental advocates was Roderick Haig-Brown. Venturing out to the Pacific Northwest at age 18 from his native Sussex to work as a logger, by 1934, after eight years logging, trapping and guiding, working on farms, cougar bounty-hunting and fishing, Haig-Brown settled in Campbell River and lived there until his death in 1976. Through the years he carved out a number of careers for himself, including that of author and judge. He served as Chancellor of the University of Victoria from 1970 to 1973.

As a writer he chronicled his adopted home and the lives of west coast people. Among his 25 books are novels like *Timber* (1942), dramatizing the logger's life, and *The Whale People* (1962), a story for young people about the vanished life of the sea-going Indians. His *The Western Angler* (1937), is still an authority for fishermen.

Fishing was Haig-Brown's passion. He explored B.C.'s coastal rivers, fishing them all and travelling the forest on foot. His favorite rivers were close to home: "The Nimpkish has all the runs that the Campbell has in fullest strength and adds to them a fine run of true summer steelheads, a wonderful sockeye run and a fabulous dog-salmon run."

Haig-Brown's concern over dwindling fish runs because of overfishing and habitat destruction led to his being on the International Pacific Salmon Fisheries Commission, a cooperative body organized in 1937 to restore the once huge Fraser River sockeye runs. He lobbied for decades for better logging practices around spawning streams and against damming the major salmon-supporting rivers.

Haig-Brown's vision is alive in Campbell River where a local project is aiming to restore his 19-acre property and to reclaim Kingfisher Creek from urban development. His idea was to create "outdoor classrooms" where people could witness the life cycles of trout and salmon — knowledge vital to the management of what Haig-Brown considered "probably the most spectacular natural resource on the face of the earth."

Sizing up the fuelwood

Alder trees in B.C.'s coastal forests are extremely fast-growing; so much so that, following logging operations, they outgrow coniferous seedlings and severely delay the growth of new softwood forests. But alder's ability to grow quickly has its positive aspects.

One Fraser Valley researcher, for example, has looked into establishing alder energy plantations. Alder also figures in a Vancouver economist's study which evaluates the possibility of using logging residues on Vancouver Island as fuel for large electrical generating plants. There's also a slow-growing market for alder lumber, and reduced cutting rates are available to operators willing to build sawmills for alder.

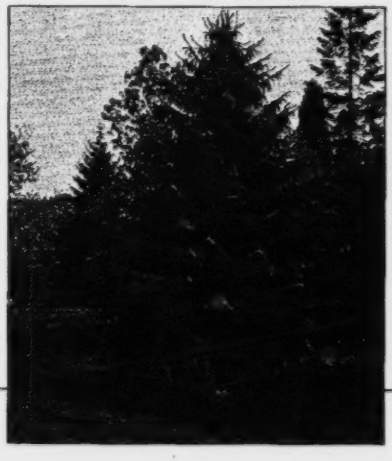
For the time being, however, alder is still used mainly for firewood. In fact, a recent Sierra Club study makes the case for developing a stable alder fuelwood industry in the Victoria area: within a one-hundred-kilometre radius of the capital stands an estimated half-million cords of standing alder. The study even provides estimates of operating costs and shows that modest profits can be had from selling firewood at $85.00 cord.

Assuming that the demand for firewood will continue to grow as people react to rising energy costs, the study warns of a possible threat to the long-term alder supply — ironically, from intensive forest management programs which aim at growing softwood forests and which try to eradicate the alder "weed."

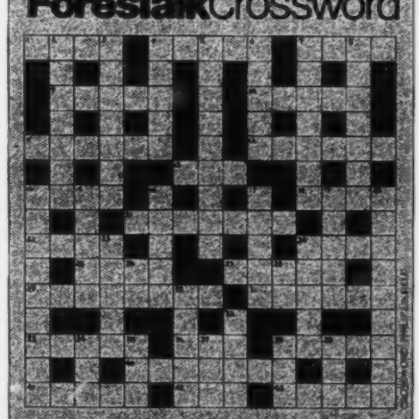
Most Beautiful

According to Hugh Johnson, author of *International Book of Trees*, the world's most beautiful evergreen is the Brewer's spruce, or weeping spruce. Branchleis a metre long dangle in pairs, weighing down the tree's long branches into a graceful arch. The effect, writes Johnson, is of "long shawls of green-black lace" which "holds arcs of sunlight or snow."

The weeping spruce is native to the high country near the coast of Oregon and Northern California, and even there it is quite rare. Since a California botanist by the name of Brewer discovered it in 1863, the weeping spruce has been prized as an ornamental tree. But it can prove difficult to cultivate when removed from its own environment.



ForesTalk Crossword



CLUES ACROSS

1 Hand-split cedar shakes are sliced off a wedge-shaped ——— which is itself split from a short-length cedar log (4)
6 Lightest of woods; found in the American tropics (5)
7 To lift weight (4)
9 Sound of bird or grasshopper (5)
10 Machinery for evening side of lumber when making boards (5)
11 To have hidden a card, or object (a tropical tree?) (6)
12 You may sometimes do this in a long hard walk through a forest (6)
13 State of treacherous roads in winter (3)
14 American fragrance (4)
16 A vein of precious metal that is a great weight on one's mind (4)
21 Small wood grown for periodic cutting (in Europe, esp.) (7)
22 To give forth, as humpys up bird sounds (4)
24 A description for a withered, dried-up leaf (4)
25 In a crowded forest one tree does this with another for sunlight (4)
27 One country of elephant lumbering (5)
29 Verdant vegetation (8)
31 Long ditch dug to check spread of a forest fire (6)
33 Double zero miles per hour equals 1930s sex appeal (5)
36 "Talking trees" are the responsibility of BC ——— (6)
38 Popular pinkish brown nut often found in pies (5)
40 To remove from wooden box (7)
41 Nick made on stock, or in wood, perhaps to keep count, as in part of machinery, as in 30 down (5)
42 Something to hit when fired (slang) (3)
43 Crooked condition in lumber caused by uneven shrinkage (5)

CLUES DOWN

2 Term usually applied to collected fruit trees, but also applicable to large unimproved/cultivated seedlings (7)
3 Machine in mill for cutting ends of logs (note difference between this and 10 across) (7)
4 Any creature that walks on two legs (5)
5 ——— to ensure that logging and roadbuilding blend in with the natural background is the goal of the Ministry of Forests' ——— management program (9)
6 Something one must be in case of fire in the summer (5)
7 Not food for pigs, but waste wood pulverized for use in boiler furnaces (6, 4)
8 Wild horses and deer have always done this for food (7)
14 If dense brush such as salmonberry were not controlled around new seedlings, the new forest would become ——— (9)
15 Only European evergreen tree with peace in its branches (4)
18 Wild evergreen shrub with yellow flowers, common in parts of Vancouver Island (5)
17 An agreeable fragrance reminds that of some blossoms, or fruits, often followed by a bloodhound (5)
19 Largest body of water (5)
20 Great mammals used to haul logs, horses and (rarely) cows (not in lumbering sense, regarded as lumbering animals) (9)
23 To fasten with a rope (3, 2)
24 Stir your mind to find this meshed earthy material (5)
26 Solid firewood is described as (5)
28 Wysiwerth of an ounce or a doctor (abbrev.) (2)
30 Part of a ratchet (series of 42 across) in bar or wheel in which pawl engages to prevent backwards movement (5)
32 Soft rocky earth (4)
34 Description for layer of leaves, needles and debris on forest floor (8)
35 Short expression of interrogation to compliment (5)
37 ——— (same backwards) (3)
39 The ginkgo tree is native to China and fossils have been discovered dating back to the Mesozoic — (3)
38 Wooden church bench (3)
39 Low-bred dog or part of a current (5)

Answers page 27

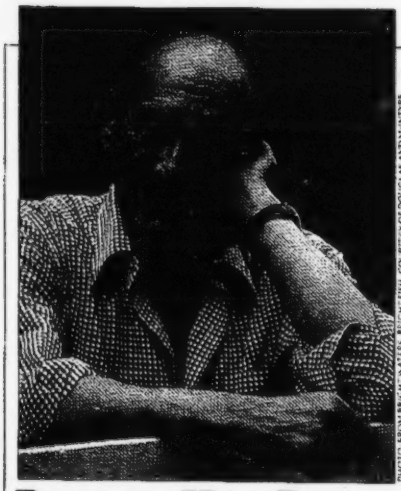


PHOTO: FROM MRS. JAMES BISSETT FISH COLLECTION OF DOUGLAS AND MCINTYRE

RODERICK HAIG BROWN

"I have never yet seen a river that I could not love. Moving water . . . has a fascinating vitality. It has a thousand colours and a thousand shapes, yet it follows laws so definite that the tiniest streamlet is an exact replica of a great river."

B.C.'s best-known naturalist and one of its first environmental advocates was Roderick Haig-Brown. Venturing out to the Pacific Northwest at age 18 from his native Sussex to work as a logger, by 1934, after eight years logging, trapping and guiding, working on farms, cougar bounty-hunting and fishing, Haig-Brown settled in Campbell River and lived there until his death in 1976. Through the years he carved out a number of careers for himself, including that of author and judge. He served as Chancellor of the University of Victoria from 1970 to 1973.

As a writer he chronicled his adopted home and the lives of west coast people. Among his 25 books are novels like *Timber* (1942), dramatizing the logger's life, and *The Whale People* (1962), a story for young people about the vanished life of the sea-going Indians. His *The Western Angler* (1937), is still an authority for fishermen.

Fishing was Haig-Brown's passion. He explored B.C.'s coastal rivers, fishing them all and travelling the forest on foot. His favorite rivers were close to home: "The Nimpkish has all the runs that the Campbell has in fullest strength and adds to them a fine run of true summer steelheads, a wonderful sockeye run and a fabulous dog-salmon run."

Haig-Brown's concern over dwindling fish runs because of overfishing and habitat destruction led to his being on the International Pacific Salmon Fisheries Commission, a co-operative body organized in 1937 to restore the once huge Fraser River sockeye runs. He lobbied for decades for better logging practices around spawning streams and against damming the major salmon-supporting rivers.

Haig-Brown's vision is alive in Campbell River where a local project is aiming to restore his 19-acre property and to reclaim Kingfisher Creek from urban development. His idea was to create "outdoor classrooms" where people could witness the life cycles of trout and salmon — knowledge vital to the management of what Haig-Brown considered "probably the most spectacular natural resource on the face of the earth."

Sizing up the fuelwood

Alder trees in B.C.'s coastal forests are extremely fast-growing; so much so that, following logging operations, they outgrow coniferous seedlings and severely delay the growth of new softwood forests. But alder's ability to grow quickly has its positive aspects.

One Fraser Valley researcher, for example, has looked into establishing alder energy plantations. Alder also figures in a Vancouver economist's study which evaluates the possibility of using logging residues on Vancouver Island as fuel for large electrical generating plants. There's also a slow-growing market for alder lumber, and reduced cutting rates are available to operators willing to build sawmills for alder.

For the time being, however, alder is still used mainly for firewood. In fact, a recent Sierra Club study makes the case for developing a stable alder fuelwood industry in the Victoria area: within a one-hundred-kilometre radius of the capital stands an estimated half-million cords of standing alder. The study even provides estimates of operating costs and shows that modest profits can be had from selling firewood at $85.00 cord.

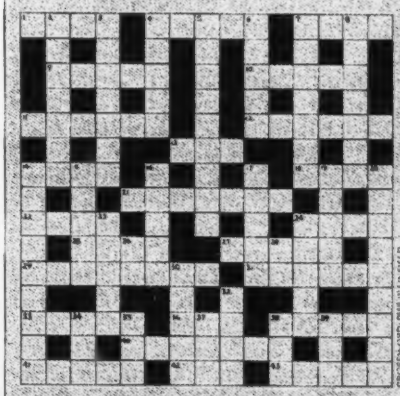
Assuming that the demand for firewood will continue to grow as people react to rising energy costs, the study warns of a possible threat to the long-term alder supply — ironically, from intensive forest management programs which aim at growing softwood forests and which try to eradicate the alder "weed."

Most Beautiful

According to Hugh Johnson, author of *International Book of Trees*, the world's most beautiful evergreen is the Brewer's spruce, or weeping spruce. Branchlets a metre long dangle in pairs, weighing down the tree's long branches into a graceful arch. The effect, writes Johnson, is of "long shawls of green-black lace" which "holds arcs of sunlight or snow."

The weeping spruce is native to the high country near the coast of Oregon and Northern California, and even there it is quite rare. Since a California botanist by the name of Brewer discovered it in 1863, the weeping spruce has been prized as an ornamental tree. But it can prove difficult to cultivate when removed from its own environment.

ForesTalk Crossword



CROSSWORD: PHILIP LINFIELD

CLUES ACROSS

1 Hand-split cedar shakes are sliced off a wedge-shaped ——— which is itself split from a short-length cedar log (4)
4 Lightest of woods, found in the American tropics (5)
7 To lift weight (4)
9 Sound of bird or grasshopper (5)
10 Machinery for evening side of lumber when making boards (5)
11 To have hidden a card, or object (a tropical tree?) (6)
12 You may sometimes do this in a long hard walk through a forest (6)
13 State of treacherous roads in winter (3)
14 American fragrance (4)
18 A vein of precious metal that is a great weight on one's mine (4)
21 Small wood grown for periodic cutting (in Europe esp.) (7)
22 To give forth, as sun rays or bird sounds (4)
24 A description for a withered, dried-up leaf (4)
25 In a crowded forest one tree does this with another for sunlight (4)
27 One country of elephant lumberers (5)
29 Verdant vegetation (8)
31 Long ditch dug to check spread of a forest fire (6)
33 Double zero miles per hour equals 1930s sex appeal (5)
36 "Talking trees" are the responsibility of B.C. — (3)
38 Popular pinkish brown nut often found in pies (5)
40 To remove from wooden box (7)
41 Nick made on stock or in wood, perhaps to keep count, or in part of machinery, as in 30 down (5)
42 Something to hit when fired (slang) (3)
43 Crooked condition in lumber caused by uneven shrinkage (5)

CLUES DOWN

2 Term usually applied to collected fruit trees, but also applicable to large groups of cultivated seedlings (7)
3 Machine in mill for cutting ends of logs (note difference between this and 10 across) (7)
4 Any creature that walks on two legs (5)
5 To ensure that logging and roadbuilding blend in with the natural background is the goal of the Ministry of Forests' ——— management program (9)
6 Something one must be in case of fire in the summer (5)
7 Not food for pigs, but waste wood pulverized for use in boiler furnaces (9, 4)
8 Wild horses and deer have always done this for food (7)
14 If dense brush such as salmonberry were not controlled around new seedlings, the new forest would become ——— (9)
15 Only European evergreen tree with peace in its branches (5)
16 Wild evergreen shrub with yellow flowers, common in parts of Vancouver Island (5)
17 An agreeable fragrance such as that of some blooms, or pine, often followed by a bloudhound (5)
19 Largest body of water (5)
20 Great mammals used in India, Burma and nearby countries in lumbering (often regarded as lumbering animals) (9)
23 To fasten with a rope (3, 2)
24 Sift your mind to find this meshed sorting utensil (5)
26 Add to wood to describe it (2)
28 A sixteenth of an ounce or a doctor (abbrev.) (2)
30 Part of a ratchet (series of 41 across) in bar or wheel in which pawl engages to prevent backwards movement (5)
32 Stiff sticky earth (4)
34 Description for layer of leaves, needles and debris on forest floor (3)
35 Short expression of interrogation or contempt in U.S. esp. (same backwards) (3)
37 The gunkho tree is native to China and fossils have been discovered dating back to the Mesozoic — (3)
38 Wooden church bench (3)
39 Low-bred dog or part of a current (3)

Answers page 21

THE NORTH COAST

by Diane Swanson

As B.C.'s timber supplies threaten to run low, logging companies are taking a closer look at the untapped timber reserves along B.C.'s north coast. But logging — and living — in this wet, bog-ridden, rugged region of B.C. are strictly for people who know how to innovate.

Wild and white, the water surges over slick black rock, splitting the forest and plunging 85 metres into the Ecstall River. Brown's Falls is splendid in its isolation — inaccessible by road and some 55 kilometres from Prince Rupert by boat. Even the roar of the falls is insulated by the close-grown forests, heavy grey mists and great brooding mountains that surround it.

The only other sound is much softer, but equally isolated — a lulling hum of drive belts. Ten kilometres from his nearest neighbour, 75-year-old Jimmy Donaldson is working in his mill.

With a steady hand he swings an overhead lever and pulls the chains taut around a damp, sweet-smelling cedar. It rolls over and the carriage moves the log slowly towards the headsaws. Donaldson watches, hopeful that some quality knot-free timber will appear.

Brown's Mill, named after its builder, Donaldson's stepfather, (and today owned jointly by Donaldson and his sister) is part of B.C.'s living history — an original, oldtime sawmill that's as old as Donaldson himself. Until a flood took out the dam in Brown's Lake about two years ago, the mill had

photographs by John Thomson

The isolation and wild beauty that are Brown's Falls** (above) **are symbolic of the north coast, where the heavy rainfall and mild climate bring to mind visions of lush growth and gigantic trees — conditions made-to-order for a thriving forest industry. The truth is that the area's steep terrain, shallow soil and poor drainage mean that scrub forests vastly outnumber good quality stands. Few people have been able to make a go of it here in the logging business, but one who has is "Buck-Tide" Jimmy Donaldson** (top). **He presides over Brown's Mill, an original, oldtime water-powered sawmill as old as Donaldson himself. Although unique in many ways, Donaldson has a tenacity and independence that make him typical of the people spawned by this tough environment.

another distinction: it was powered entirely by the water fall.

In the early days, the sawmill produced the lumber needed to build a dozen fish canneries and later to build packing boxes for halibut. When the fishing industry turned to cardboard packaging instead, commercial activity at the mill stopped.

But a determined Donaldson continues to spend most of each year at Brown's Falls. In early spring he journeys from Prince Rupert in his 1927 tug, the "Two Rivers," running against the tide so often he has earned the nickname "Buck-Tide." Using logs hard-won by either beachcombing or hand-logging, Donaldson produces cannery floats and a bit of boat lumber at the mill. He even plans to fix up his flume so he can move off diesel and back on water power from Brown's Falls.

Although Jimmy Donaldson and his water-powered sawmill are unique in many ways, his tenacity and independence make him typical of the people a tough environment demands. Certainly the isolation and wild beauty that are Brown's Falls are symbolic of the north coast district.

Extending 400 kilometres from Butedale in the south, up along the inside of the Alaska Panhandle as far as Stewart, the North Coast Timber Supply Area — one of 33 timber management areas established by the Ministry of Forests over the past two years — is dominated by mountains and divided by rivers, channels and inlets. Much of the land is chopped up into small islands. Even Prince Rupert, the only sizable community on the coast, sits on one island with its airport on another.

The terrain is inhospitably steep, rocky, and splintered by waterfalls. Many of the falls are streams abruptly dropping from secluded, hanging valleys — the most dramatic geological feature in the district.

Then there's the rain. An annual 2300 mm of it falls on Prince Rupert at the mouth of the Skeena River. At higher elevations, westerly exposures receive more than 2500 mm — the wettest spots in Canada. And even when it's not raining, it's usually overcast.

Although the heavy rainfall and mild climate of the north coast bring to mind visions of lush growth and gigantic trees, the area's steep terrain, shallow soil and poor drainage mean that scrub forests vastly outnumber good quality stands. Most of the north coast forest is old and decaying, dominated by bare-topped cedar and mistletoe-infested hemlock. Since the area has virtually no fire history, the forests have just been left to grow old and decay.

Predictably, floods are common. The one that cost Donaldson his water power did $35,000 in damages to his property. But the flood he remembers best was in 1936 when he was up the Skeena logging cottonwood for China.

"On a dare," says Donaldson. "I took down the mast on my tug — it drew about 5.5 feet of water — and ran it right through the snowshed at mile 56 on the CNR. There was seven feet of water on the track!"

Besides the overbearing wetness, the north coast suffers from excessive supplies of muskeg and rock. "There isn't a tablespoon of natural soil in all of Prince Rupert," bemoans Ministry of Forests regional manager Jack Buckert. "It's all muskeg; some of the deepest anywhere."

Although some logging companies, and even hand-loggers like Jimmy Donaldson, talk of taking out trees three metres in diameter, forest giants are not common in the North Coast TSA. The nutritionally poor muskeg can stunt growth so severely that some mature trees are no taller than bushes or shrubs. People from Prince Rupert cut their own Christmas trees under a power line at a muskeg site just outside the city. "Where else could you find a 100-year old pine that fits into your living room?" asks Jack Buckert. "It's like natural bonsai."

Rain, muskeg and a rugged terrain have always plagued the people who settled the north coast. Back in 1906, when Jimmy Donaldson's stepfather was first putting his sawmill into operation, railway workers were struggling to set up shacks and tents on the unwelcoming site of Prince Rupert. The Grand Trunk Pacific Railway was beginning work on some of the most difficult sections of railway that were ever built in North America.

And it was no easier to put in roads. The area has always suffered from a dearth of highways and even secondary routes. The costs of building just a rough gravel road in the north are still astronomical — rising over $100,000 per kilometre.

Expenses like that deter many companies from logging in the north

The centre of commerce for the north coast is Prince Rupert, a town whose economy is dominated by commercial fishing and fish processing. Fishing boats tied up at the harbour (top left) are a common sight, as are the early morning line-ups for the bus ride (left) to the fish-processing plant.

More than anything else, what characterizes Prince Rupert is its rainfall — all 2300 mm of it annually. Wet weather is a way of life here and goes practically unnoticed by children hurrying home from school (right).

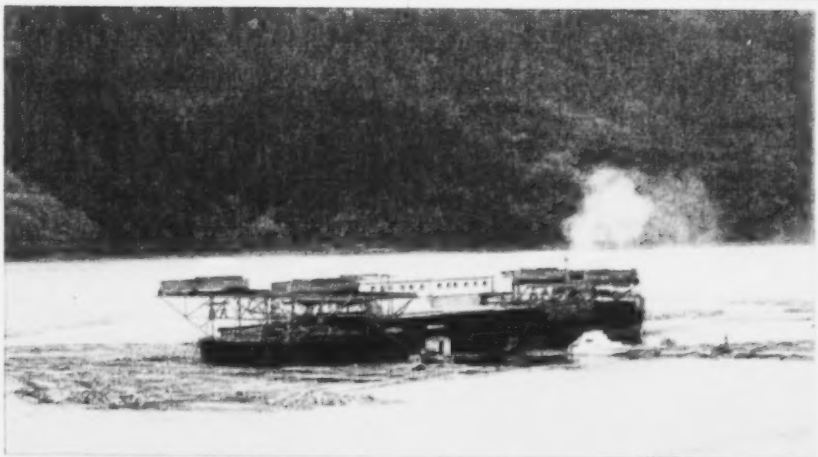
coast, especially since the decadent trees are sold mainly for pulp and the pulp log market is notorious for its wild price fluctuations.

"Operating costs in the north coast average four to eight dollars per cubic metre more than in the Vancouver region," says Bill Jackson. "And when the timber market falls, the north coast is the first to feel it." Existing licencees have had trouble cutting the timber allotted to them by the Ministry. While there are some good forest stands in the north, many are very inaccessible, like those found in high, hanging valleys.

The north coast waters teem with salmon, herring and halibut, and are well-supplied with groundfish and shellfish as well. Generations of native Indians lived off this resource, particularly the halibut. Today commercial fishing and fish processing dominate Prince Rupert's economy. The area has become the second most important fishing centre in the province, employing about 5,000 people during the fishing season. Salmon is the most valuable catch, and a federal salmonid enhancement program will increase the salmon production even more.

But Mike Darnell, representative for the United Fishermen and Allied Workers' Union, says, "Programs like the salmonid enhancement are very desirable. But they can be quickly neutralized by slides, like the one caused by logging at Riley Creek on the Queen Charlottes."

While the activities of other resource developers, such as the controversial dumping of tailings from the Amax molybdenum mine into Alice Arm, seriously concern fishermen, there seems to be no argument that logging activities can have the strongest, most far-reaching impact on fisheries. The steep slopes of the north coast, characterized by thin layers of soil over bedrock, erode easily, and almost every river, stream,



Logging on the north coast requires an innovative approach, such as the helicopter operation developed by Grizzly Timber. Enormous skycranes (top right) airlift over 8,000 kilograms of logs at a time from hillsides too steep to be logged by conventional means. Carried to a lumber processing barge (above) in a nearby inlet, the logs are trimmed, graded, cut to length (top left), and bundled for export overseas. This trial project may serve as a prototype for future north coast logging operations.

estuary and inlet has some importance for rearing fish.

The Khutzeymateen River, for example, is a prime salmon spawning area. Concern for the salmon and for the grizzly bears in the area has led to a proposal to make the watershed an ecological reserve. But there's an estimated $130 million worth of timber there, and foresters believe that with a carefully planned operation they can log the watershed and protect the habitat too.

Ministry of Forests staff in the region recognize that this type of project calls for innovative logging measures and feel that there's lots of opportunity in the North Coast TSA for the sort of individual or company willing to take the risk of trying something different.

One such company is Silver Grizzly Timber of Prince Rupert. Working at Mouse Creek on the Khutzeymateen Inlet and along the Kitsault River near Alice Arm, Silver Grizzly is lifting logs off hillsides so steep that they simply cannot be logged by conventional methods. An enormous skycrane (an oversized helicopter sporting a 60-metre cable) can fly one-and-a-half kilometres inland, pick up 8,000 kilograms of logs in a single load and dump them in the water — all in about two minutes. Both time and load size are critical to the company which pays $5,000 an hour to operate the skycrane.

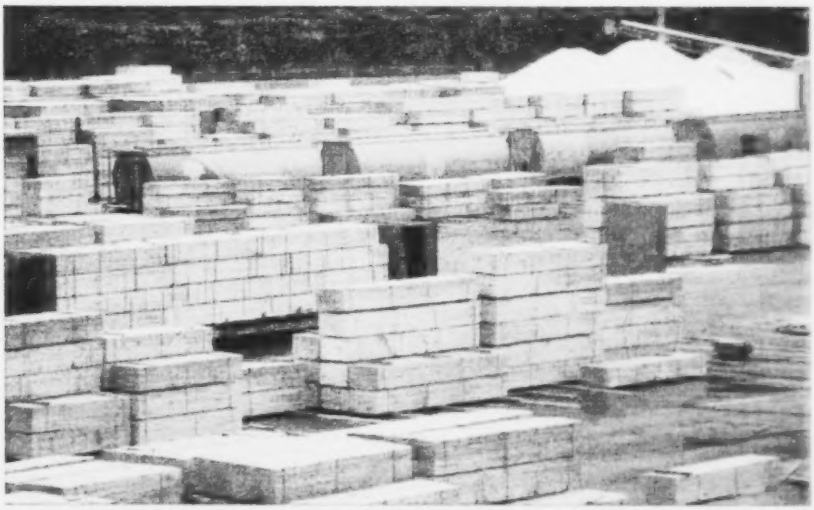
Silver Grizzly also runs a 111-metre log-processing barge on the Khutzeymateen. Huge grapples lift logs out of the water for trimming, grading, cutting to length and bundling. A burner incinerates waste on the spot.

The Ministry of Forests encouraged Silver Grizzly to demonstrate the value of helicopter logging in the area. Environmentally, it seems very sound, and the technology is developing well. It remains to be seen, however, if helicopter logging will ever be economical on its own merits. Silver Grizzly was given Order In Council permission to export the bulk of its logs to Japan. Without that incentive, it wouldn't have been able to attempt this experimental project.

Helicopter logging is not yet competitive for the domestic lumber market. But with both road-building costs and log values on the rise, one day it may be economical to market logs from north coast heli-

copter operations to southern British Columbia. Says Ministry of Forests timber range and recreation manager Verne Strain: "If you don't try something now, nothing will happen in the future. You don't wake up one Monday morning 20 years from now and — poof — the technology you need suddenly is in place and everybody's out there doing something."

Many would like to see north coast logs processed into lumber locally. "Timber from here — our timber shouldn't go to supply mills in the lower mainland," says Peter Lester, Prince Rupert's mayor. He's spent 23 years in office (the longest consecutive term of any mayor in Canada) and his opinion is firm: "It's about time timber was allocated to businesses that are going to locate here."



In the early 1970s a Prince Rupert sawmill had to close down after failing to make a go of it milling low-grade logs; today there isn't one major sawmill on the north coast. The B.C. Timber Limited (formerly Canadian Cellulose) pulpmill at Port Edward is the area's largest single manufacturing employer, but the wood chips and pulp logs it uses come mainly from mills in the B.C. interior.

Silver Grizzly recently made a proposal to build a north coast sawmill. Whether or not it's economical will depend a great deal on innovation, such as logging less accessible and lower quality stands and making good use of the timber there.

Today, the building of a sawmill is only one of a number of proposals and opportunities being placed in front of the people of the north coast. They are looking at the possibilities of very immediate and rapid industrial development. New grain-handling facilities are planned for Prince Rupert; a bulk terminal to receive coal from the northeast is being built; there is also talk of a liquified natural gas plant and a petro-chemical complex.

Lester sees the coal and grain facilities adding about 1,000 people to Rupert's present population of 20,000. Other projects could bring in at least another thousand.

These development projects raise certain concerns: concern from B.C. Timber Ltd. that coal dust will contaminate its pulp; concern from the fishermen that increased use of the port will harm valuable fish populations; and overall, concern because all this development is being proposed in an absence of studies into its possible effects. "Our port finds itself in a particular bind," says Tony Atherton, editor of Prince Rupert's *Daily News*. "We're trapped between layers of government, each avoiding responsibility for such studies."

In a move typical of north coast independence, the *Daily News* initiated its own development study. It called for briefs from all local interest groups and redistributed them to relevant government agencies.

Perhaps more than anywhere else in British Columbia, the people of the north coast have developed a history of innovation in response to an unforgiving geography. But whether it's in shipping, fishing or logging, development in the north coast will happen as a direct result of people like Jimmy "Buck-Tide" Donaldson who choose to live on their own terms, whether the tide is with them or not.

The natural resources of the north coast — fish, timber and minerals — form only part of the development picture. The port of Prince Rupert (above), which is fast becoming a gateway to the Orient, is looking at a major expansion. new grain-handling facilities are planned; a bulk terminal to receive coal from the northeast to ship to Japan is being built. there is also talk of constructing a liquitted natural gas plant and a petro-chemical complex. But whatever happens, development in the north coast will occur as a direct result of the independent and innovative spirit of the people living there.

phantom orchid PHOTO: R. LONG

Indian pipe
PHOTO: LIZ POPE

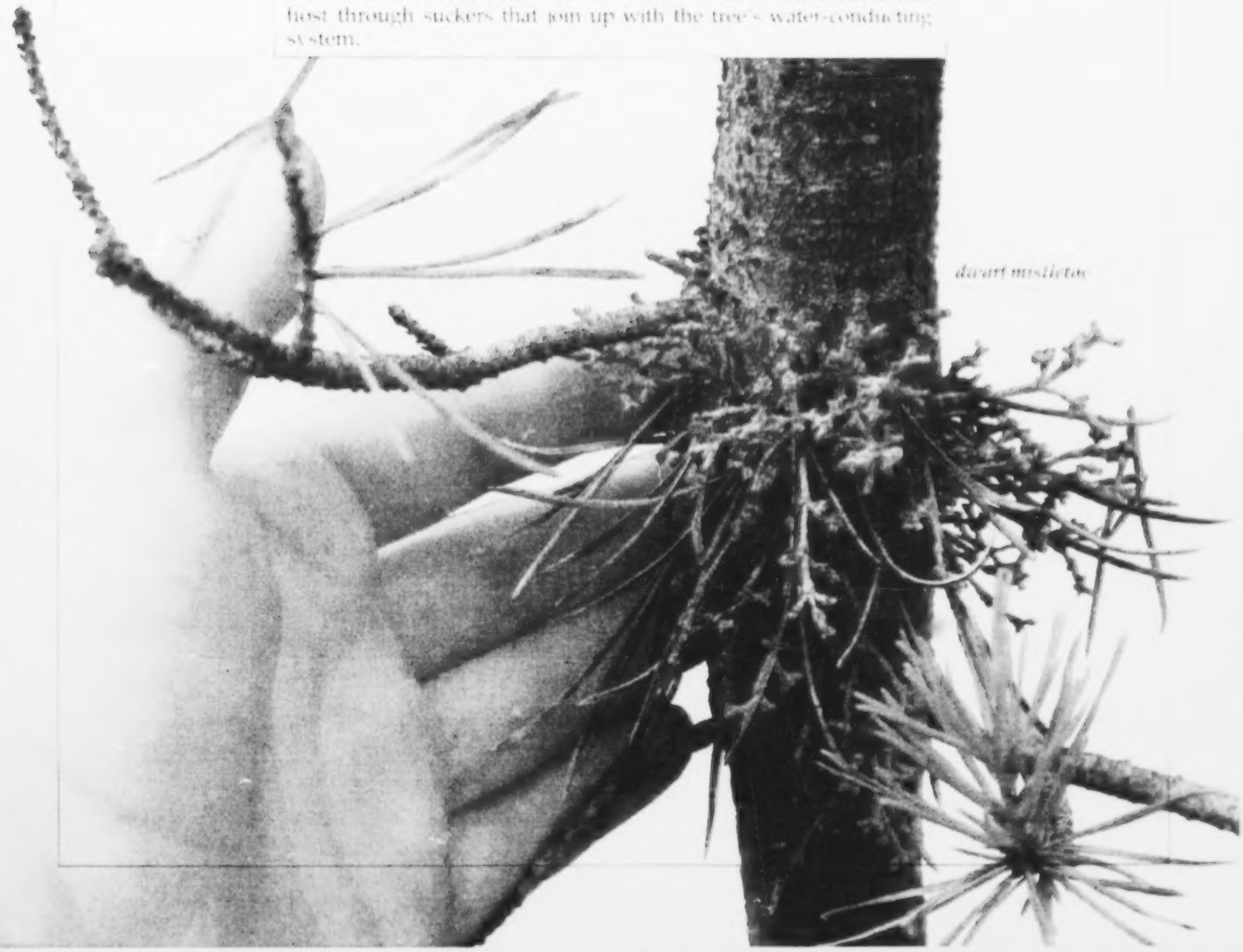
by Enid K. Lemon

Parasites & Saprophytes

Every year, at the time of the winter solstice, the Druid elders in their long brown robes walked in the silence of the night to a sacred oak from which hung small clusters of green-yellow leaves and waxen berries. Gathering their precious harvest high in the oak, they then returned and distributed sprigs of this sacred plant to everyone in the village.

The ancient peoples of Britain revered this small plant as an emblem of good fortune and happiness. We know it as mistletoe. To this day a sprig of mistletoe hangs over many a doorway at Christmas time, inviting those passing below to seal a pledge of friendship with a kiss. The European mistletoe grows on many deciduous trees, including poplar and apple. There is a legend in England that the mistletoe was originally a handsome tree and its wood used to make the cross on which Christ was crucified; for this it was condemned to be a humble parasite until the end of time.

Mistletoe is a common parasite plant which gets its nourishment from a living host. Because it contains chlorophyll in its aerial shoots it makes its own food, but it must draw minerals and water from its tree host through suckers that join up with the tree's water-conducting system.



dwarf mistletoe

In British Columbia much damage is caused to our coniferous forests by the dwarf mistletoe. This bears no resemblance to the European, or true mistletoe, and it is more completely dependent on its host. Dwarf mistletoes reduce the growth of the host trees and speed tree mortality. There are four species that infest our forests, and by far the greatest loss is caused by those which attack the western hemlock and lodgepole pine. The annual loss of growth in these two tree species has been estimated at 4.25 million cubic metres, enough wood to produce about 750,000 tonnes of pulp.

Hemlock dwarf mistletoe only occurs along the coast and as far east as the Coast Range (for some reason the hemlock stands of the interior wet belt are not affected). This mistletoe also attacks shore pine, a smaller and often contorted form of the well-known inland lodgepole pine.

The dwarf mistletoe on lodgepole pine is widely distributed all through the interior from Prince George southeast to the Alberta border.

Larch dwarf mistletoe, which grows in the southeastern interior, will also attack lodgepole pine. Douglas fir dwarf mistletoe does not occur on the coast and only infests this one species of tree in the extreme southern interior.

The life cycle of the dwarf mistletoe starts in the autumn with an explosive discharge of a single seed from each mature fruit. This seed can shoot out of its casing with tremendous speed (up to 80 km/h) for a distance of roughly nine metres. Each seed is covered with a sticky substance which enables it to adhere to tree foliage. The seed germinates the following spring, and a toothlike structure called a radicle is formed. The tip of the radicle forms a holdfast from which the plant grows.

During the second year there is a slight swelling of the infected branch. In the third year aerial shoots appear and the swelling increases. During the next year the shoots produce flowers, and pollination and fertilization take place. In the fifth year the cycle is complete, and seeds are dispersed to continue their damage to our forests.

Other plants with similarities to the parasitic mistletoe are called saprophytes. These derive their nourishment from dead organic material and do not produce chlorophyll like green plants.

In the heather family are some most intriguing saprophytic plants. Once seen, never forgotten, Indian pipe (*Monotropa uniflora*) is like a jewel set amongst the moss or litter of the forest floor. Ghost-like clusters grow from a ball of matted roots, which look like the prickly spines of the sea urchin. These spines are tiny rootlets, which are thoroughly encased in a fungus. When scientists studied these roots under a microscope, they discovered that some of the strands entered the decaying plant debris while others trailed into the soil, thus gathering the necessary nourishment. Indian pipe is one of the few plants of the forest floor to exist without the aid of sunlight.

On the stem grow white scale-like bracts rather than leaves, and there is a single colorless flower. As the seed head develops, the nodding flower loses its pipe-like appearance, the stem straightens and the flower begins to point upwards. Soon after, especially if the whole clump is touched or bruised, it becomes clammy and turns black before decomposing. Hence its other common name, "corpse plant."

Indian pipe has been used as a medicinal herb. The Indians pulverized it and mixed it with water to use as an eye lotion.

pine drops

stout cancer root

pinesap

Candystick (*Allotropa virgata*) is spectacular. Found in the coniferous forests of Vancouver Island and the adjacent mainland, its brilliant red marking on its white stem and brightly coloured sepals make this plant almost unbelievable. Its common name of "candystick" or "barber pole" is most descriptive.

Pinesap or many-flowered Indian pipe (*Hypopitys monotropa*) takes the name of the genus from the Greek "hypo" (beneath) and "pitys" (pine tree) a reference to its favourite habitat. This is a wide-ranging plant which occurs throughout the southern two-thirds of the province.

Cone plant (*Hemitomes congestum*) is one of the oddest of our saprophytes. The emerging plant is a delicate pink which, as it grows, looks like a small cauliflower head. Then the scale-like leaves elongate to produce a seven-inch stem like a club. At the top the flowers are packed together, which accounts for both its scientific and common names. Cone plant is limited to Vancouver Island, and discovering this rare plant is one of the thrills of walking in the woods.

Coral root, whose genus name *Corallorhiza* comes from the Greek meaning "coral" and "root," describes the underground part of the stem that develops fleshy, coral-like rhizomes which take the functions of a true root. In British Columbia we have four species of these saprophytic plants that are members of the orchid family.

In the same family as the coral roots we have the rarest of all, the Phantom Orchid (*Cephalanthera austinae*). The whole plant is a pure waxy white except that within the throat of the flower there is a lovely spot of golden yellow. To add to its beauty the flowers are delicately scented. This plant grows in very few places and to find one would make a red-letter day.

The *Orobanchaceae* or broomrape family contains interesting root parasites. The genus name, *Orobanche*, is derived from the Greek "orobus" (a clinging plant) and "ancho" (to strangle). When the seed sprouts, it produces a tiny root which grows and branches underground until it touches its specific plant host. Then a sucker is sent out which attaches itself to the root. The most beautiful plant of this genus is the one-flowered cancer root (*Orobanche unaflora*) which is parasitic on stonecrop.

Another rare plant is poque (*Boschniakia hookeri*), named after two famous botanists, the Russian Boschniaki and the British Sir William Hooker. The common name is derived from a Northwest coast Indian language. This curious plant with scale-like leaves may be yellow, brown or purple. It is not an easy plant to find as it looks like an upturned cone nestled among the salal from which it gains its nourisment.

Although the members of the broomrape family in British Columbia cause little damage to their hosts, several species are a serious threat to a variety of food crops in the Middle East and Asia where they cause great economic losses.

Look for these interesting plants in our forests. Some will be easy to spot, but others will need a great deal of patience!

candystick

Hypomyces lactifluorum

ground cone

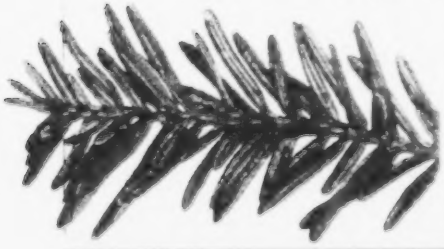
Province of British Columbia
Ministry of Forests
HONOURABLE TOM WATERLAND, MINISTER

WESTERN HEMLOCK

Tsuga heterophylla

Western hemlock once seemed undistinguished when compared to its famous forest companions of the coast: Douglas fir, western red cedar and Sitka spruce. Reaching 50-65 metres (roughly 150-215 feet) in height and with diameters of up to 150 cm (five feet), it wasn't any larger or smaller than its coastal cousins; as lumber it had no outstanding qualities, had a higher moisture content than Douglas fir, and worst of all, carried the stigma of the undesirable eastern hemlock.

Then came the Koerner brothers, Czech lumber merchants fleeing from Hitler. The Koerners are associated with two major developments in making hemlock a commercial wood: they kiln-dried the lumber, which removed the moisture problem, and in the U.S. they changed its commercial name to Alaska pine.



Today this most plentiful tree of the coast forest is the most harvested of B.C. coastal trees and figures prominently in reforestation projects. It is considered as good as Douglas fir for quality lumber, and its wood is notable for hardening with age and wearing into a resilient, non-splintering surface.

Hemlock is easily distinguished in the forest by its drooping leader. Because the tree is long-lived (up to 500 years) and its seedlings grow well in dense forest shade, hemlock has come to dominate many forest areas.